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# On Aspects of Korea's Five-Year Development Plan

by

Charles Wolf, Jr.

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Reference Center  
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March 28, 1961

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**On Aspects of Korea's Five-Year  
Development Plan**

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March 28, 1961

Honorable Tae Wan Son  
Minister of Reconstruction  
Seoul, Korea

Dear Minister Tae:

In the work assignment which you gave me with your letter of March 4, 1961, three problems were raised:

1. Consideration of alternative theoretical approaches to economic development involving: (a) a limited number of sectors, and (b) a large number of sectors, and the relative applicability to Korean conditions of these different approaches.

2. Evaluation of the draft statement by the Economic Development Council on "Method and Principles of the New Five-Year Economic Development Plan," and suggestions for revising it.

3. A brief appraisal of current proposals for the re-organization of economic planning in the Korean government.

A copy of your original letter of March 4, with the attached work assignment, is included at the end of this report as Appendix 1.

The present report is essentially an attempt to respond to these problems, with emphasis on the first two. I have also included some observations on certain aspects of the Korean economic situation which seem to me to differentiate it from many other Asian countries, and to be particularly relevant to the task of formulating Korea's first Five-Year Economic Development Plan.

The attached report is divided into four parts. Part I consists of comments on particular aspects of the economic situation, which I feel are especially relevant to development planning in Korea. The last three parts take up the problems raised in the March 4 work assignment: Part II

dealing with multi-sector versus key-sector growth; Part III with suggestions for revising the EDC statement on "Method and Principles"; and Part IV dealing very briefly with my reactions to the proposed reorganization of economic planning in Korea. I have also included, as Appendixes 2 and 3, two technical memoranda on normalization of interest rates, and investment priorities, which I wrote in response to requests from the Ministry of Finance, and the Economic Development Council, respectively.

I should say quite frankly that time limitations have precluded my dealing with these several problems in as detailed, thorough, and informed a manner as I would have liked. Nevertheless, I feel that the month I have been in Korea has been made both more productive and more pleasant as a result of the candor, cooperation, and assistance, provided to me by members of your staff, as well as of other government agencies. I would like to acknowledge especially the cooperation I have received from Daniel Lee, of the Ministry of Reconstruction, Kim Chong Dai of the Economic Development Council, Lee Hahn Been of the Ministry of Finance, Ahn Jong Jik of the Bank of Korea, and Lee Byung Joon and Hong Sung Hi of the Korean Reconstruction Bank, and from my able assistants, Lee Duck Soo and Lee Hwa Kyun, of the Ministry of Reconstruction. Finally, I wish to thank the USOM staff for their assistance, and William Eilers and the Asia Foundation whose sponsorship and financing made my consultation here possible. Needless to say, none of these worthy gentlemen or organizations shares responsibility for the views and suggestions contained in this report.

Sincerely,

(s)

Charles Wolf, Jr.  
Economic Advisor

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# I

## SOME ASPECTS OF THE KOREAN ECONOMIC SITUATION RELEVANT TO A NEW FIVE-YEAR PLAN

### 1. Recent Growth Rates

In the past four years, from 1957 through 1960, the average annual rate of growth in Korea's national product in constant prices has been about 5 per cent. But more significant than this *average* growth rate, is the fact that the annual rate of growth has steadily diminished over the four year period. Granted the statistical uncertainties that are involved, the Bank of Korea data show that the growth in real GNP was 8.6 per cent in 1957, 6.9 per cent in 1958, 5.2 per cent in 1959, and 2.3 per cent in 1960. (Assuming that the rate of growth in population was either constant or increasing during this period, per capita output would show an even sharper relative decline in growth rate.)

Over this four year period, gross fixed capital formation remained at about 13 per cent of GNP. This implies that the capital-output ratio for the economy as a whole has been gradually rising. The same input of fixed capital, as a percentage of GNP has, in other words, yielded a steadily diminishing percentage increase in real output, implying that the efficiency of capital use has been steadily declining.

These factors are of considerable significance in setting growth targets for the new plan that will be reasonable and realistic. The prospective five-year plan confronts not only the problem of raising the absolute rate of growth, but of reversing the sharply downward trend that has characterized the past four years.

### 2. Market Imperfections and Rigidities

All underdeveloped economies are characterized in greater or lesser degree by imperfections in the functioning of the market mechanism. These imperfections usually reflect strong cultural, and social traditions, and constitute a significant handicap to accelerated growth. Korea has its fair share of such traditional imperfections and rigidities. However, in comparison with other underdeveloped countries, what strikes me particularly about Korea is the extent to which these traditional and long-standing imperfections and rigidities are accompanied by many other more recently created imperfections. Taken together, the newly created rigidities constitute perhaps an even greater obstacle to accelerated growth than the standard and typical traditional rigidities. Let me cite some specific examples:

a. Korea is ahead of many underdeveloped countries in having a fairly elaborate network of relatively large-scale government enterprises. But what strikes one most about them is that, of the sixteen major enterprises, nine showed a net loss in their 1960 income-and-outgo statements, and three others returned a profit on total government equity less than 6 per cent, which is probably something below 25 per cent of the opportunity cost of capital.

b. The structure of interest rates on loans extended by government lending institutions, notably the Korean Reconstruction Bank and the Korean Agriculture Bank, covers a wide range

between 3 and 15 per cent. Widely different rates are often charged to different borrowers from the same kind of loan, or even to the same borrower at different times, depending upon whether the source of loanable funds is from counterpart, reconstruction bonds, or any one of a dozen other special funds.<sup>1</sup> Such a structure of interest rates has a strong tendency to permit and sustain inefficient enterprise, as well as to facilitate the allocation of scarce capital on grounds that do not maximize economic growth.

c. The price of coal and fertilizer charged by the government is the same in all parts of the country. This kind of pricing system implies that transportation is a free service; consequently it has the effect of promoting a greater utilization of coal and fertilizer in areas more distant from production centers, and a lesser utilization in areas close to the production centers, than efficient allocation would warrant.

From the standpoint of accelerating Korea's long term growth, it is probably as important to eliminate or reduce such imperfections and rigidities as to increase the quantity of real capital formation.

### 3. Economic Competition With North Korea

One can as easily overemphasize as overlook the importance of the economic competition between South and North Korea, in formulating a reasonable development plan. The danger of overlooking it is fairly obvious. If the developmental performance of South Korea is grossly inadequate in comparison with that in North Korea, public confidence in the South Korean government can be sapped with consequences that might be disruptive of political stability.

But there is also a danger of overemphasizing this competition, or of misconstruing its significance. In some sense, the "welfare" content of a unit of growth in economies with a reasonable amount of free choice is substantially greater than the welfare content of a similar unit of growth in controlled economies. The point is simply that, for growth to have a meaningful "welfare" content, it has to be in response to or in reflection of consumer preferences. Since these preferences usually do not appreciably influence the direction of growth in controlled economies, such economies may grow rapidly in numerical terms at the same time as they produce a much less than proportionate increase in welfare or satisfaction for the people living under them.

Moreover, there are various statistical peculiarities in regard to North Korean growth data which tend to inflate the growth that is reported. What I have in mind here is not simply the use of data for propaganda purposes, but rather the tendencies in Communist accounting practices to measure growth in terms of gross value, including intermediate products, rather than value added. This practice often has the effect of substantially inflating the magnitude of any actual increases in output that occur.

The general inference I would draw from these observations is that it is neither necessary nor likely that South Korea equal the overall growth rate reported by North Korea, *but*, in regard to growth in physical production in particular sectors or commodities, it is essential that South Korea should excel at least in some. Plan formulation should be approached with this concept in mind.

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<sup>1</sup> Appendix 2 contains a memorandum written to Mr. Lee Hahn Been, Director of the Budget Bureau, on interest rate normalization, in which this problem is discussed at greater length.

The division of the country has another implication for plan formulation. Given what seems to be the reasonable assumption of continued division for the indefinite future, the plan should reflect a readiness to incur some investment costs for purposes that might not be competitive if unification were achieved. At the same time, the country's division would seem to suggest that, where possible, effort should be made to avoid overbuilding industries that might not be competitive if unification were to occur subsequently.

Moreover, while the plan should not rely on any resumption of trade between South and North Korea because of the obvious uncertainties that are involved, it may very well be possible and economically desirable at some future time to consider particular trading arrangements. The economically sensible basis for such trade might be in relation to an exchange of commodities which, from the standpoint of what South Korea obtains from the North, could always be imported from alternative sources of supply outside the country. It might be beneficial to consider, for example, an exchange of South Korean rice for North Korean fertilizer, but would not be desirable to consider exchanging rice for electric power.

#### 4. The Defense Burden

Although Korea has the largest number of men under arms of any underdeveloped country in the free world, I believe the burden this imposes on the Korean economy has often been overstressed. Actually, I have been impressed by the extent to which defense support aid not only compensates for the military burden, but, over and above such compensation, provides resources which are available for expanding capital formation. Thus, approximately 95% of the direct operating costs of Korea's defense establishment are borne from counterpart funds at the present time, and virtually all equipment costs are borne from military aid funds. For the current fiscal year, about one third of total non-project defense support plus project defense support plus Public Law 480 aid is excess to the defense budget's requirements.

Of course, there are various hidden costs imposed by the military effort which are not reflected in defense outlays. Some of the country's best executive and managerial talents are probably in the military at salaries below their economic value to the economy in alternative civilian occupations. I have been told, too, that the low pay of soldiers is often supplemented by income transfers from their families, in effect constituting a concealed tax burden on the families. And there is a psychological cost which is even more difficult to estimate: the "cost" represented by draftees who return to their villages after military service unwilling to resume their previous life yet unable to do much else.

At the same time, however, there are hidden benefits conferred by the military effort which are similarly not reflected in the defense budget. The literacy training and at least some of the skills imparted by military service do result in increased labor productivity and earning power later on. More tangibly, the obsolescence of military equipment, financed from military aid funds, provides a large and cheap source of scrap iron and steel that benefits the industrial sector to a considerable extent.



Obviously, it is very difficult to make any reliable estimate of most of these concealed costs and benefits to see whether there is any net additional burden on the economy imposed by the military effort. In any event, it is clear that military expenditures of 165 billion hwan are large (one-third of the 1961 national budget). Quite apart from the question of whether the military effort imposes a net burden, from the standpoint of Korea's economic development, it would seem that the more important question to ask is how can the military complement the Five-Year Plan and assist the country's growth? I will return to this important question later.<sup>1</sup>

### 5. Consumer-Goods Aid Versus Capital-Goods Aid

There has been and is much discussion in Korea concerning the fact that \$3 billion of post-war U.S. aid has been "wasted" because it has been largely used for consumer-goods which have inflated consumption levels, raised aspirations, and made the Korean economy a dependent one. Had capital goods been imported, it is said, the situation would have been different, and the economy would now be in better condition.

The economic reasoning behind these arguments is weak, and should be clarified in order to encourage constructive thinking and planning for Korean development. In an effort to contribute toward such clarification, three points should be briefly stressed, although to develop them fully would require considerable elaboration: (1) Most of the difficulties and "wastage" attributed to consumer-goods imports are not appropriately attributed to them at all. In large measure, the importation of consumer-goods was related to a need to finance the military effort, and this was a need the capital-goods imports, of equivalent amount, could not have met. (2) From the standpoint of efficient use of resources, any given amount of developmental aid should *not* be strictly confined to *either* consumer-goods or capital-goods. It should be used flexibly, with varying combinations of both sorts of goods related to different projects, in an effort to provide a particular productive asset or project in Korea at minimum cost. Confining aid to capital-goods can create project inefficiencies and misallocations as great as those created by confining aid to consumer-goods. (3) In those cases, where, unfortunately, available dollar aid is *not* subject to flexible use, but is, for example, confined to surplus agricultural commodities, the exercise of appropriate tax and expenditures policies by the Korean government, should permit the "conversion" of the consumer-goods into capital formation in Korea, though the dollar value of the new capital will be less than the nominal dollar value of the agricultural surpluses. Accomplishing this "conversion" is easier said than done. But the principle is a valid and operational one, and should be borne in mind in determining the extent to which some consumer-goods imports in the future can be effectively translated into capital formation rather than additional consumption.

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### 6. Recent Inflationary Trends

In the past four years, 1957 to 1960, the wholesale price index has risen by over

<sup>1</sup> See pp. 14-15 below.

20 per cent. Excluding grain prices, wholesale prices have risen by over 40 per cent. Although inflation can sometimes be a source of forced savings for investment purposes, and consequently can make a contribution to accelerated growth, it is an extremely risky technique and one which, in the case of Korea, should be scrupulously controlled. Apart from the problem of balance of payments repercussions, and the generally inequitable impact of the forced savings burden on different segments of the population, inflation tends to distort seriously the resulting pattern and type of investment. Specifically, long term investment tends to be discouraged because of uncertainties concerning the probable trend of relative commodity prices in the future. Because, under inflationary conditions, changes depreciate so large a fraction of the monetary yield of new investment, mistakes in estimating the future pattern of relative commodity prices can be very costly to new investors. Consequently, they will tend to avoid long term investment which would be particularly sensitive to such mistakes. Effective and extensive participation by the private sector in long term development thus requires an expectation of reasonable stability in the price level. For a country like Korea, which has an active and important private sector, reasonable price stability should be a clearly recognized adjunct to a successful development plan.

## **7. Korea's Advantages and Disadvantages in Relation to Other Underdeveloped Countries in Asia**

One is quickly aware of some of the disadvantages which Korea faces in planning its economic development compared to other Asian countries. The high rate of population growth (over 2.2 per cent), the low percentage of arable land (about one fifth) and the relatively rigorous climatic conditions are some obvious disadvantages in comparison, for example, with Burma, the Philippines, Indonesia, or Thailand.

But there are also some important advantages and they are perhaps less evident. The size of the manufacturing and construction sector in relation to GNP is fairly large compared to other undeveloped countries of equivalent size, and this would appear to provide a good basis for further growth. In terms of government influence on the scale and pattern of capital formation, development institutions and techniques are already in existence for exercising such influence, e.g. through the counterpart accounts, the KRB, KAB, and the government enterprises. In other countries such institutions need to be created, while Korea is in a position to build on a foundation which already exists.<sup>1</sup> At the same time, Korea has a relatively active, and potentially still more active, private sector in the industrial field which can be a powerful force in the country's development.

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<sup>1</sup> In 1958 and 1959, 35-40% of gross capital formation was financed through government institutions, including the share financed by the deficit on current account, which is in effect channelled to private enterprise through government lending institutions. However, as previously mentioned (pp. 1-2 above), there seem to be good reasons for believing that effective use of these institutions and techniques to assure efficient investment choices has not yet been accomplished. In fact, because of the size and power of these institutions, misallocations and inefficiencies on the part of the government can be much more costly and detrimental to Korean development than in countries where the institutions do not exist or are less influential.

Finally, though the resources available for industrial development are not abundant, coal, tungsten, and other minerals provide a relatively promising basis for long term industrial growth.

The road to self-sustained economic growth in Korea will be a rough one, but at least some of the grades are less steep than they are in other Asian countries.

## II

### APPRAISAL OF MULTI-SECTOR VERSUS KEY-SECTOR GROWTH CONCEPTS

I rather doubt that it is either necessary or desirable to go into an extended discussion of the theory and the extensive literature on this subject. To do so would require a short monograph, which I am not about to write. Instead, it may be more relevant to try to summarize briefly the main points that are involved in the theory of multi-sector or balanced growth, than to summarize the main points that underlie the theory of key-sector or unbalanced growth, and finally to suggest some implications of these points for Korea's own development plan.

#### 1. Multi-Sector or Balanced Growth

Underlying the balanced growth argument is the view that industries and sectors of the economy are closely related to each other, both as sources of inputs and markets for outputs. Consequently, an attempt to develop one or two or only a very few sectors at a time will run into serious snags, because the few sectors or industries that are emphasized will encounter shortages of inputs (for example, if the development of steel capacity were to exceed the expansion of coal capacity), and often more important, shortages of demand. In the latter case, for example, an expansion of agricultural output might result simply in lower prices for farm products unless output and income in industry and other sectors were simultaneously rising so as to provide a wide domestic market for rising agricultural output. Of course, it can be argued that increasing export should provide an alternative way of widening the market, and that increasing imports should provide an alternative source of inputs in the event that balanced interindustry growth does not occur. However, advocates of the balanced growth theory (principally Nurkes and Rosenstein-Rodan) contend that inelasticity of foreign demand, particularly for agricultural output, and balance of payments constraints, preclude a resort to increased exports and imports as remedies for a lack of balanced domestic growth.

#### 2. Key-Sector or Unbalanced Growth

Several different versions of the theory of unbalanced growth have been advanced.

The principal versions are the following:

a. Rostow, viewing economic growth in historical perspective, has observed that wherever marked and sustained economic development has occurred, one or two

sectors seem to have played a "leading" role, in the sense that the growth of this sector or sectors has been far more rapid than that of the economy as a whole. In the case of British growth, for example, the textile industry in the 18th century played such a leading role; in the U.S., railroad development in the 19th century allegedly played a similar role. In Japanese development, at the end of the 19th and the early 20th century, agriculture, and the textile and steel industries grew sharply ahead of the rest of the economy; while in Sweden's development, timber production, and industries directly related to it, seem to have led the country's economic growth.

b. Viewing the problem of growth from the standpoint of planning, rather than history, Singer and others have criticized the balanced growth argument not so much on grounds of desirability as on grounds of feasibility. Because the shortage of resources available for investment in underdeveloped countries is so critical, they argue that there is a compelling need to concentrate these scarce resources in particular fields. The particular fields in which scarce resources should be concentrated are those which yield increasing returns to scale, and which are likely to generate external economies, or "spillover" effects, that in turn will stimulate investment in other industries. Such fields comprise especially the so-called "social overhead" activities, that provide "infrastructures" on which potential new industry depends, e.g. railroads, roads, power, and river valley development.

c. Instead of emphasizing the shortage of resources for investment, another version of the unbalanced growth argument focuses on the shortage of entrepreneurial and decision-making ability, in both government and the private sector, as the principal obstacle to accelerated growth in underdeveloped countries. There is both a static and a dynamic aspect of this argument. The static aspect involves the notion that the limited available supply of managerial and decision-making ability should be concentrated in a few sectors because of the probable economies of scale from so doing, and the danger that dispersing scarce talent might result in ineffectuality. The dynamic aspect of the argument stresses the need to increase the available supply of such scarce managerial and decision-making ability. Thus, Hirschman argues that the way to stimulate and evoke additional supplies of these resources is by concentrating on only a very few sectors, and, in the process, deliberately creating bottlenecks in some sectors and surpluses in others. The contention is that these bottlenecks and surpluses are likely to serve as signals and stimuli which will attract latent entrepreneurship, as well as latent savings, to move into other sectors which can relieve the obvious bottlenecks or can utilize the obvious surpluses. New industries which, though they rely heavily on imports for their initial sources of inputs, require inputs that can eventually be produced at home, are considered as especially promising candidates for emphasis in this sequence of planned, uneven growth. For example, if domestic resources exist for mining iron ore and making coking coal, establishing a steel rolling mill, which at first uses imported pig or steel ingots, might well be expected to have stimulative effects on domestic enterprise and savings. The existence of the functioning market for imported pig and steel ingots would tend to stimulate domestic enterprise to replace imports by indigenous production. In Hirschman's

view, such sequential, interindustry "linkages" are likely to play a decisive role in economic development.

Now, what general implications do those differing views on balanced and unbalanced growth have in the light of Korean conditions? In my judgement, the arguments for at least some unbalanced growth, as advanced by Singer and Hirschman, do have relevance in Korea. The scarcity of available resources does require a concentration of effort in fields that can yield economies of scale, and external economies or spillovers. From both standpoints, selection of the power and agricultural sectors for concentration appears sensible. Power is subject to fairly considerable economies of scale, and, over time, can have marked stimulative effects on industrial development. Emphasis on agricultural investment and productivity seems justified because of the predominant role of the agricultural sector in the economy as a whole, the existence of a number of probably high-yielding agricultural investment opportunities,<sup>1</sup> and the need to widen the domestic market for industrial output by raising agricultural income. At the same time, however, it is important to keep in mind several warnings and qualifications in applying the notion of key-sector or unbalanced growth to planning economic development in Korea.

First, though judicious concentration certainly has its merits and its stimulative effects, such concentration must clearly be kept in bounds or the resulting balance of payments and/or price effects can seriously disrupt the entire developmental effort.

Second, economic development is a long-run problem. The achievement of self-sustaining growth will not be accomplished by Korea's first five-year plan, nor ever its second, or third. As each development program paves the way for the next one, the sectors requiring emphasis and priority are very likely to need modification and alteration. Moreover, sectors that were previously emphasized, and then de-emphasized, may in a later plan require re-emphasis and a corresponding re-allocation of investment. (India's decision to return in its Third Five-Year Plan to the heavy emphasis on the agricultural sector contained in the First Plan is a case in point.) In effect, I would suggest that Korea's development strategy, while requiring concentration and emphasis on a few sectors, will require sequential modification in successive five-year plans of the particular sectors that are emphasized.

Third, though there is a need for concentration, this need still leaves unanswered the vital questions concerning the *amount* of concentration, and the *particular sectors* to be emphasized. While it is certainly true that there is a critical need to expand power capacity as a base for industrialization, recognition of this need does not determine the amount of the requisite expansion during the first five year plan period. Should the target for expansion be 480 megawatts, or half this number? Should concentration on the power sector be interpreted in terms of expanding coal capacity and thermal generators together (i.e. in a "balanced" way), or should there be a deliberate over-expansion of coal-mining capacity, and of coal-refining capacity, in order to provide high caloric coal

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<sup>1</sup> See pp. 14 below.

for export purposes above the needs of thermal generating capacity at home? These are obviously critical questions which are not answered by a simple decision to concentrate on power as one of the key sectors in the five-year plan. Yet answers to, and decisions about, these questions are essential if the plan is to be an efficient and responsible one.

Finally, the decision to focus emphasis on two or three sectors does not obviate the need for explicit and detailed analysis and decision concerning the basic components of a new plan. The basic components of a national development plan are:

- a. A clear and quantitative statement of national economic objectives, in the aggregate and by particular sectors;
- b. A public sector investment program, arrived at by detailed cost-benefit analyses of various alternative projects and representing an optimal, or at least reasonable, means of achieving the stipulated objectives;
- c. A definition of rough and approximate production and investment goals for the private sector;
- d. A careful analysis of means and sources of financing for the public and private sector investment programs.

Of course, none of these components should be regarded as firm and unalterable. Effective planning requires a continual feedback of experience into the revision and modification of objectives, and of public and private investment targets for achieving these objectives, *while* the plan is being implemented. A decision to concentrate on a few sectors does not, in other words, alter the need for these basic and difficult components of effective planning.

### III

## SOME SUGGESTIONS CONCERNING THE STATEMENT OF "METHOD AND PRINCIPLES OF THE NEW FIVE-YEAR ECONOMIC DEVELOPMENT PLAN"

I have reviewed the draft statement on "Method and Principles" by the Economic Development Council. There is much of value in the EDC draft. But instead of dwelling on what is of value, let me focus specifically on comments and suggestions for making it into a more helpful guide to the substantial work remaining to be done to formulate a comprehensive, and logically consistent, plan of which the country can be proud. While recognizing the need for speed, I would re-emphasize that planning is a difficult and time-consuming task. In view of this fact, and of the considerable work remaining to be done, I would strongly suggest that the next year, through the end of 1961, be considered a preparatory year. During this time, stress should be placed on effective implementation of the National Construction Service, and of only the top priority power and coal projects, and of a strengthening of agricultural extension services and completion of the large number of small irrigation projects already under way. Also,

during this preparatory period, formulation and crystalization of the new Five-Year Plan should be completed, with a target date of January 1962 for beginning the first year of the plan period.

It is my understanding that the main purpose of the EDC statement of "Method and Principles" is to guide the planning work which is under way by EDC itself, as well as to guide the preparation of inputs for the Plan by the several ministries, particularly Commerce and Industry, and Agriculture. Beyond this, the statement may serve as an introduction or preamble to the Plan document when it takes final form. With these broad purposes in mind, I have the following specific suggestions to make concerning additions to, or clarification of, the present EDC draft. The suggestions should be considered in the light of the preceding comments on the Korean economic situation (Part I), and on multi-sector vs. key-sector growth (Part II) since several of the suggestions are based on the earlier discussion.

### **1. The First Five-Year Plan, and Korea's Long-Term Economic Growth**

Self-sustaining economic growth can be oversimply characterized as a process in which growth in aggregate real income is maintained for a protracted period, at a rate substantially above the rate of population growth, with increments in income and improvements in technology at each point of time providing savings and skills for subsequent increments and improvements, *without* a chronic balance of payments deficit. The aim of development planning is to move a country more closely and more rapidly toward self-sustaining growth. But, however rapid the movement, it requires long-range effort. Five years are a relatively short period in terms of the time-horizon that is relevant for realizing self-sustaining growth. Although it is useful to break the long-range effort that is required in to convenient segments for planning and evaluation purposes, it should be recognized that each plan period is only *part* of a longer-term effort.

From this standpoint, Korea's first Five-Year Plan should be regarded as the first of several plans to follow. Sectoral emphasis in the first Plan should be considered as subject to change later in the sequence. The Plan should try to build on and from an existing situation, and in turn to lay a basis for further growth in subsequent periods. But it should *not* be oversold as being itself *the* long-range program, or as likely to achieve a "takeoff" by the end of a single five-year period.

### **2. National Economic Objectives**

It is important that the objectives of Korea's Plan be both realistic and challenging. If they are unrealistically ambitious, they run the risk of substantial shortfalls and disappointment. If they are too meager, they run the risk of invidious comparison with North Korean development.<sup>1</sup> In the light of these conflicting risks, I would suggest that the following broad objectives be given consideration in revising the statement of "Method and Principles":

a. During the plan period, the targeted average *annual rate of growth in national*

<sup>1</sup> See pp. 2-3 above.

product in constant prices should be something in the neighborhood of 5 per cent to 5½ per cent a year. Such a rate may be considered as reasonable in the light of recent experience; yet it is challenging, both in the sense that, if attained, it would reverse a downward trend of recent years, and also that it would be somewhat higher than the rate of growth aimed at in many other Asian countries. India's Third Five-Year Plan, for example, envisages an average annual growth rate of 5 per cent for the 1961-1966 period. To guide planning, it would be worthwhile to formulate the average rate of growth in terms of a gradually rising rate: say, 4-4.5 per cent in the first year; 4.5 to 5 per cent in the second; 5 to 5½ per cent in the third; 5½ to 6 per cent in the fourth; and 6 to 6½ per cent in the last year of the plan.

b. With such an aggregate growth rate, *per capita consumption* could be increased by perhaps 1.5 per cent per year. Given an annual rate of increase in population of about 2 per cent, this would mean that nearly 3.5 per cent of the 5 to 5½ per cent increase in aggregate real income would be required for consumption purpose.<sup>1</sup> (Of course, if the rate of growth in population can be reduced, a higher rate of increase in per capita consumption would be possible with the same rate of increase in aggregate consumption).<sup>2</sup> The remainder of the increase in aggregate real income could, with appropriate measures to increase domestic taxes and savings, be divided between reducing the country's import surplus and further increasing domestic capital formation.

c. Consistent with these targets, it would be possible to increase employment significantly. Assuming a rise in the average productivity of labor of, say, 2 per cent a year, employment would increase by about 270,000 a year.<sup>3</sup> With an assumed rise in labor productivity of 3 per cent per year, 190,000 new jobs would be created.

### 3. Capital Requirements

What would be the *investment* requirements associated with these targets? Assuming a crude incremental capital-output coefficient of 3, the targets would require that gross capital formation increase from about 13 per cent of GNP in 1960 (about 275-280 billion hwan of which perhaps 25-30 per cent can be roughly attributed to Korea's import surplus), to an average of about 16.5 per cent over the Plan period. Relating the increase in investment requirements to the annual increases in national product mentioned in (2) (a) above, investment would have to be raised to 13.5 per cent in the first Plan year, 13.5-15% in the second year, 15-16.5% in the third; 16.5-18% in the fourth; and 18-

<sup>1</sup> If  $q$  is the desired annual percentage increase in per capita consumption,  $p$  the annual percentage increase in population, and  $C$  the share of consumption in national product, then the percentage increase in product required, or absorbed, by increasing consumption is:  $C(q+p+qp)$ . ( $C$  is about 95 per cent of GNP in Korea).

<sup>2</sup> In view of the high and perhaps rising rate of population growth in Korea, it would be desirable to include in the statement of "Method and Principles," and in the Plan itself, reference to measures to control population growth. India's experience in this field, and the reference which have been made to the problem in each of its three Five-Year Plans, would be worth studying carefully.

<sup>3</sup> Based on the assumption that, in 1960, there were 7.8 million gainfully employed, the GNP in current prices was 2,047 billion hwan.



19.5% in the fifth. These are very big numbers absolutely and relative to other Asian countries. They might warrant some initial increase in external capital availabilities—both from foreign government and private sources, and would certainly require increases in domestic taxes and domestic savings. But, by the third or fourth year of the Plan period, it should be possible, and certainly would be desirable, for increases in domestic savings and taxes to be increasingly used *not* to raise investment further, but to reduce and replace the import surplus as a source of financing for domestic capital formation.

#### 4. The Need for Efficient Use of Capital

Accelerated growth requires not only increased capital formation. It requires as well increased attention to the efficient use of existing capital, and to better allocation of new investment. In the light of the impressionistic, but impressive, indications of inefficient use and allocation previously referred to,<sup>1</sup> I believe that the opportunities for Korea's development to profit from increased efficiency are tremendous. These opportunities include the use of capital to increase utilization of idle labor and of potentially cultivable upland areas. The concept behind the National Construction Service makes very good sense from both standpoints. In the short run—i.e. in the time period encompassed by the first Plan the payoffs from more efficient use and allocation are very likely to be considerably greater than those from increased capital formation.

These considerations should be emphasized in the revised statement on "Method and Principles". There are two specific suggestions I would like to put forward in this connection:

a. Consideration should be given to the desirability of adding to the proposed Plan a new "strategic" or "key" component, which would stress measures to rationalize government enterprises, to increase the productivity of existing investment, and to improve the allocation of new investment. Some of these measures are institutional and organizational. Many may require some initial increase in operating expenditures (e.g. pay increases for tax assessors), or capital expenditures on existing facilities (e.g. for improving transmission lines to reduce transmissional power losses). The desirability of such incremental expenditures should be appraised from the standpoint of their contribution to increased yield or productivity as an alternative to expenditures for new plant and equipment.

b. In making allocative decisions, particularly with respect to the choice of new government projects, and to the use of KRB and KAB funds and of counterpart for financing private projects, explicit criteria should be applied to estimate and compare the social marginal productivity of alternative projects. These criteria should make use of reasonable and explicit social accounting, or "shadow" prices in cases where there are strong reasons for expecting that a divergence exists between prevailing market prices and prices which would accurately reflect the relative abundance and scarcities of domestic and imported commodities and services. A memorandum on this subject is attached as Appendix 3 to this report.

<sup>1</sup> See pp. 1-2 above.

## 5. Emphasis on the Power Sector

In the relatively short time I have been here, it has obviously not been possible for me to study this key segment of the proposed Plan as carefully or as thoroughly as I would have liked. Nor have I seen the detailed analysis of the specific program for expanding thermal and hydroelectric power which is presently under consideration. With these qualifications and reservations in mind, there nevertheless seem to me to be two specific suggestions which may be relevant to plans for expanding power generating capacity.

a. At the same time as consideration is given to the amount of needed expansion in new capacity, and to the preferred combination of hydro and thermal power for providing this capacity, more attention should be given to measures that will save existing power, and increase the productivity of power use. In this connection, it is my understanding that almost 35 per cent of current power production is lost, either through technical losses in transmission, or through "unrecorded losses" representing power consumption that is not paid for. (The Korean draft Three-Year Plan of January 1960 estimated that the first type of transmission loss represented about two thirds of the total loss, while one third, or about 12 per cent of total power production, represented unrecorded losses.) Clearly, while investment costs are incurred to expand new capacity, the government should consider it a matter of high priority to incur both the administrative and possibly the investment costs required to reduce substantially these large losses from current power production. If recovery of these losses is appreciable, it may be possible to reduce some of the investment requirements for providing new capacity.

b. Estimates of the generating capacity required to satisfy the present excess of power demand over available supply range from 30 megawatts to 80 megawatts, while forecasts of the probable annual rate of increase in power generating requirements range between 5 and 10 per cent per annum.<sup>1</sup> There is thus considerable uncertainty concerning the extent of the present power deficit, and the probable rate of growth in power requirements. More specifically, the uncertainty relates to both the price elasticity of demand for power, and to the income elasticity of demand over the next several years. I would therefore suggest that consideration be given to the somewhat paradoxical policy of preceding or accompanying future *increases* in power generating capacity with some *increases* in power rates charged to industrial users, *as long as there is believed to be unfilled power demand under the present industrial rate structure*. It is manifestly inefficient to charge a rate which leaves an unsatisfied demand, *given full feasible use existing capacity*. In general, for given capacity, a sufficiently high rate should be charged which, while maintaining full use, allocates the limited available supply to the users for whom it will have the highest yield. In practice, what this policy would mean is that if industrial rates are raised, as planned, by 50 per cent this year, they ought to be raised still further as or

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<sup>1</sup> The higher figures come from the Report on Electric Power Supply by the Commonwealth Associates, Incorporated, of Jackson, Michigan, dated Dec. 29, 1960.

before new generating capacity is created, *if an unsatisfied demand persists at the new rates.*

## **6. Emphasis on the Agricultural Sector**

As in the case of the power sector, it has not been possible for me to explore this key-sector in any reasonable detail during my brief stay in Korea. Nor have I been able to get a very clear or precise idea concerning the specific components of the proposed agricultural plan that is now under consideration. Still, there seem to be a number of interesting and potentially highly productive possibilities in this field. Some of them ought to be mentioned explicitly in the statement on "Method and Principles," in anticipation that they will be more fully elaborated in the detailed plan itself. These promising possibilities include: strengthening the existing extension services; attempting to develop upland areas for resettling population and for cultivation of ramie and other cash crops; tidelands reclamation; developing and using powered limestone to combat soil acidity; stimulating livestock production, particularly for export purposes; and gradually mechanizing double-cropping areas, using small rototillers or hand tractors, along the lines of Japanese experience.

## **7. Need for a High Marginal Reinvestment Coefficient**

Successful economic growth, especially if it is to rely decreasingly on foreign aid, requires that a disproportionately high share of increments in real income be saved and reinvested. Technically, the marginal savings coefficient needs to be substantially higher than the average ratio between savings and current income. Consequently, in revising the statement on "Method and Principles," there should be a discussion of sources of financing which would stress the need for increasing tax collections as well as encouraging private savings. In this connection, the recent policy of the Ministry of Finance in lowering tax rates in order to discourage evasion, and hopefully to increase tax yields, is interesting, even if seemingly paradoxical. I would suggest that this policy be combined with some increase in the salaries of the roughly 2,000 tax assessors, that might include an incentive provision to relate salary increases to increases in assessments and collections. It would also be desirable to refer in the revised statement to the important role that normalization of interest rates can play in increasing available private savings, provided that price stabilization is reasonably effective.

## **8. The Role of the Military**

Given the size of Korea's defense budget, which has been previously referred to, it is important to ask whether and how the military effort can be used to complement economic development. There would seem to be a number of promising opportunities. The use of some military forces for road building and similar projects under the National Construction Service is one imaginative example that would appear to warrant expansion. More generally, periodic deployment of military forces in areas away from the DMZ (Demilitarized Zone) to work in smaller groups with and for rural communi-

ties in construction, and in new upland development and resettlement, projects should also be given consideration.<sup>1</sup> It is true that the communists make use of techniques similar to this. But this is not a good reason for South Korea to refrain from doing so.

Another opportunity would appear to lie in trying to revise and supplement the standard training given to draftees, with a view toward inculcating skills and trades that would be useful in civilian life. A manpower survey of the probable requirements for various kinds of skilled labor during the First Five-Year Plan, and subsequently, would be helpful as a first step in deciding how the military might participate in developing such skills. In a developing country, it is probably useful, if unorthodox, to regard a large military establishment like the Korean army as, in part, a vocational training institution.

Finally, consideration might be given to developing a military establishment which replaces some manpower by some "infrastructures", like roads, ports and airfield, in an effort to obtain, *for an equal defense outlay*, a roughly equivalent military capability and a considerably enhanced set of economic side-effects.

Clearly, these suggestions would require a major reorientation of the thinking and attitudes of the military establishment, both in Korea and in the United States. And I do not pretend to know how to accomplish this change of attitude. Inevitably, it will take time. But it would seem advisable, in formulating the Five-Year Plan, to refer to the potentially important role of the military, and to solicit support and suggestions from the Ministry of National Defence concerning ways in which the military effort can more effectively contribute to capital-formation and skill-formation in furtherance of Korean economic growth.

#### IV

### PROPOSALS FOR REORGANIZATION OF ECONOMIC PLANNING IN KOREA

Daniel Lee, Director of the Bureau of Planning in the Ministry of Reconstruction, has described to me the general outline of the proposed reorganization of economic planning in the Korean government. In general, as I understand the proposals they seem quite sensible, and I have given my oral comments to Mr. Lee. Very briefly, the only specific suggestions that I have to make on this subject are the following:

1. It would seem to me desirable to consider establishing a cabinet level Planning Commission roughly along the lines followed in India. The Planning Commission would be chaired, as in India, by the Prime Minister, with the head of the proposed Office of Economic Planning acting as Vice Chairman. The remainder of the Commission's membership would consist of ministers of the principal ministries concerned with economic

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<sup>1</sup> The on-going work of the Viet Nameese military in organizing, administering and protecting settlement of the Central Plateau region would warrant study in this connection.

development.

2. The proposed Office of Economic Planning should provide the staff work for the Planning Commission and report regularly to it. In addition, there should be a separate evaluation office, independent of the Office of Economic Planning, that would also report to the Planning Commission. The purpose of this evaluation unit would be to conduct a continuing appraisal of progress and effectiveness of the Plan, and of gaps between production and investment targets on the one hand, and accomplishments on the other. Such evaluation should be fed back into the Planning Office, through the Planning Commission, in order to assure that the Plan remains flexible during the Plan period, and that both the on-going Plan, and the formulation of subsequent plans, can profit from the experience being gained in carrying out the current Plan. For obvious reasons, it is highly important that this evaluation unit be staffed by competent and vigorous personnel, and that its status be independent of the Office of Economic Planning.

**APPENDIX 1: Work Assignment**

**March 4, 1961**

**Dr. Charles Wolf, Jr.  
The Rand Corporation  
California, U. S. A.**

**Dear Dr. Wolf:**

I have the pleasure of transmitting in the attached a copy of work assignment on assisting the Ministry of Reconstruction in checking of consistencies, review of alternatives and other necessary theoretical guidances necessary for drawing a long-range development plan.

I would like to express how much we treasure your visit to Korea and will be looking forward to get valuable assistance from you.

I wish you pleasant stay and successful mission.

**Sincerely yours,**

**(S)**

**s/t/ Tae Wan Son  
Minister**

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## SCOPE OF WORK ASSIGNMENT

### **1. Comparative Evaluation of Various Approaches in Planning**

A theoretical evaluation of various approaches adopted for economic development is desired by the ROK Government. This will serve as a policy guidance in preparing a new long-range economic development plan.

The Government of Korea is especially interested in getting a critical appraisal of approaches with: (1) a limited number of sectors (leading sectors) and (2) a large number of sectors. The appraisal is desired to be made on these various approaches in relation to the planning agencies and the administrative machineries available in Korea.

It is felt that with the limited number of economists available for economic planning and the administrative machinery inexperienced in implementing economic plans, the frame of reference in planning should be as simple as possible.

### **2. Examination of the New Plan**

The Government has already undertaken the preparatory work for the new plan, and is engaged at present in surveying the magnitude of funds available for investment and in examining the feasibility of the proposed targets for various sectors. The full scale programming and planning will start as soon as the draft "Guiding Principles of the First Five-Year Economic Development Plan" has been finalized. A critical and thorough appraisal on the "Guiding Principle" is therefore prerequisite.

### **3. Reorganization of the Economic Agencies**

A reorganization of the economic agencies of the Government has been under consideration. A brief appraisal of the proposed reorganization, in relation to the propositions to be made on the above items, is highly desirable.





## SOME COMMENTS ON INTEREST RATES IN KOREA

As I understand the structure of interest rates and loanable funds in Korea, (and it is not a particularly easy subject to understand), there are three principal and separated markets for loanable funds. The first is the free market, where rates run 30 to 45 per cent per annum. Presumably the higher end of this range applies to longer term loans, given equivalent credit worthiness of long and short term borrowers. The second is the commercial bank market, where rates are set by the Monetary Board with a rate of 17½ per cent per annum applying to capital (i.e. long term) loans, and from 8 to 18½ per cent applying to operating (i. e. short term) loans. Again, presumably lower rates are charged on short term loans of otherwise equivalent risk than on long term loans. Finally, there are the government lending institutions, i. e. the Korean Reconstruction Bank and Korean Agriculture Bank. Actually, this category might be further divided into two categories because the sources of funds for the two institutions often differ, as do the type and terms of loans which they make.<sup>1</sup>

On loans extended by the KRB and KAB, interest rates vary widely and peculiarly. For example, the rate on capital loans varies between 3 and 15 per cent, and often there is a wide variation in the rate charged on the same kind of loan to the same borrower depending simply on the particular fund from which KRB or KAB makes the loan. The rate on operating loans by the KRB similarly varies between 6 and 16 per cent, and the structure of short term rates on loans extended by the KAB covers a similarly wide range.

As I understand it, the Finance Minister's view of "normalization of interest rates," applies to the first and second categories above (i.e. free market and commercial bank rates). Normalization is construed in terms of reducing or eliminating the gap in rates between these two markets in order to stimulate the flow of deposits and savings into commercial banks, to reduce the tendency that now exists for borrowers to seek loans from the commercial banks in order to relend at higher rates in the free market, and to reduce the need for the more or less arbitrary rationing of commercial banking funds which often leads to favoritism and preferential treatment toward borrowers on inappropriate grounds. I believe this concept of normalization to be a sound one. It should tend to promote some additional private savings, and to permit some redirection in the allocation of existing savings. Though it will exercise considerable pressure on existing businesses for whom the cost of capital is a major cost of production, this pressure should tend to encourage both efficient operations and self-financing of plant expansion by the

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<sup>1</sup> Although National Bonds and Reconstruction Bonds provide some of the loanable funds used by the government banking institutions and though they carry a nominal interest rate of 5 per cent, from an economic viewpoint I would be inclined to place them closer to the first, (i.e. free market) category rather than the third category. As I understand it, purchasers of government bonds, although they receive a nominal rate of 5 per cent, are typically able to tie their purchase to preferential treatment from the government of a sort that more nearly reflects the 30 to 40 per cent discount at which government bonds are subsequently traded on the free market.

affected firms.

In the further comments I have to make I would like to take up what I consider to be a second aspect of normalizing interest rates, namely that of partially reducing the tremendous disparity between interest rates charged by government institutions in the third category above and those charged in the first two categories, and perhaps still more important, reducing the disparities on loan rates *within* the third category itself. My impression is that this wide disparity among the various rates charged by the government lending institutions represents a strong stimulus to a misallocation of new investment.

Before pursuing this second aspect of interest-rate normalization, there is a basic question which is of considerable importance for planning economic development, which needs to be considered: namely the question of why interest rates on developmental loans should be different from, that is to say lower than, the market rate? There are numerous reasons which can be given to answer this question:

1. For types of investment which yield external economies or spillover effects that benefit other parts of the economy, and which cannot be appropriated by the owners of the particular investment concerned, the interest rate charged to the borrower will generally have to be less than the market rate if the investment is to be undertaken at all. Examples of types of investment that yield external economies are railroads, roads, land reclamation, and multipurpose hydroelectric power projects. Of course, whether and to what extent such external-economy-yielding investments should be undertaken depends on some estimate of how large and reliable the potential external economies will be.

2. Development planning implies that the judgement of politically responsible planners concerning the appropriate time discount differs from the market's judgement. Given a politically determined decision concerning the desirability of long term growth, a project with a yield which rises over time should not have its future yield as heavily discounted as the market interest rate would discount it. Hence, the interest rate applied to projects with a long term pattern of yield should be lower than the market rate.

3. Certain kinds of investment may entail non-economic benefits which the government wishes to encourage. Examples might be in the fields of housing, rural development, and scientific research. My own judgement would be that for projects of this sort, a strong case can be made for using appropriated funds as a source of financing for government projects rather than using preferential interest rates as a concealed subsidy.

4. To compensate for divergencies that exist between the social and the private costs of other factors of production, such as labor or foreign exchange, it can be argued that interest rates should be modified in order to improve investment allocations. Thus if the existing exchange rate is over-valued, the private profitability of import-replacing or export-increasing industries may be less than the social profitability. Under these circumstances a lower interest rate may be justifiable to compensate for such imperfections in prevailing market prices. (This point is discussed further in my memorandum on invest-

ment priorities which is attached.) My own judgement would be that under these circumstances a direct subsidy would be preferable to preferential interest rates to achieve the desired effect, because a subsidy is more overt and identifiable.

In summary then, I would say that the best reasons for a divergence between interest rates on development loans and interest rates in the free market are the reasons mentioned under (1) and (2) above: namely, external economies, and divergence between social and private time preference. However, I would emphasize the risks and dangers of having interest rates on development loans at too low a level. Such a policy promotes the inefficient use of capital in several ways. It stimulates capital intensive techniques of production, and it dilutes the rationing effect that a higher interest rate would have in tending to weed out firms which are less efficient in the use of other factors of production than capital. Where, as in the case of the KRB and KAB, interest rates on development loans are not only far below the market rate but also involve quite disparate rates for different kinds of loans, and often different rates for the same kind of loan to different borrowers (and at different times even to the same borrower), the resulting tendencies toward inefficiency, favoritism, and misallocation are intensified. Of course, the problem of disparate interest rates involves the Combined Economic Board as well as the KRB itself. Many of the disparities and preferential treatment for some categories of KRB loans derive from CEB criteria governing the use of counterpart for lending purposes by government institutions. For example, these criteria involve preferential treatment for small as against medium and large enterprises, and lower interest charges during a construction period of indefinite duration (which would predictably tend to discourage rapid completion). I have looked at these criteria and terms fairly carefully, and without going into details I believe they could benefit substantially if they were revised along the lines of greater concern for the yield on capital, and fewer attempts to discriminate among firms and industries in regard to interest rates.

In the light of these comments, I would make the following suggestions concerning the general problem of interest rate normalization:

1. In addition to normalizing interest rates in regard to the free market and the commercial bank rates, normalization should be construed as warranting both some reduction in the disparity between rates on government loans and the commercial-free market rates, as well as reducing or eliminating the disparity among the various rates charged on government loans by the KRB and the KAB.

2. Instead of a range on KRB and KAB loans which now covers from 3 to 15 per cent, I would suggest something like a 12 or 14 per cent rate with interest and repayment to begin at some stipulated time in the future, perhaps one or two years to allow for construction time. The stipulated time would constitute an incentive to complete construction rapidly.

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In effect, applying such a unitary rate on government loans would constitute an initial or *primary* rationing device for screening out projects or loan applications which do not yield at least this much internal rate of return. Because the free market cost of capital will be substantially above this rate, the demand for loanable funds would exceed

the available supply at this unitary rate. Consequently the government lending institutions would have to ration the limited supply still further. For this purpose, they would need a *secondary* rationing device. To provide such secondary rationing of developmental capital, the lending institutions might be instructed to take into explicit account the external economy effects of proposed projects (i.e. the benefits created by a project which are not appropriable directly by the project owner), and the existence of identifiable divergencies between private and social cost of other factors of production because of controlled or distorted market prices. This would involve the use of some estimate of social accounting prices in making allocative judgements, along the lines described in the attached memorandum on investment priorities. Finally, after the minimum yield criterion represented by the unitary interest rate were satisfied, the lending institutions should try to take into account the time pattern of yield in making their secondary rationing decisions. If between two projects, both of which were able to meet the interest rate criterion, one would tend to yield a rising pattern of output over time, preference should be given to the latter.

**APPENDIX 3: Investment Priorities**

**TO:** Mr. Kim Chong Dai  
Deputy Chairman, EDC

**DATE:** March 16, 1961

**FROM:** Mr. Charles Wolf, Jr.

**SUBJECT:** Investment Priorities and Profitability Ratios

In the course of the discussions that I had on March 13, 1961 with the Economic Development Council, two questions arose concerning investment priorities among different industries, and profitability ratios. At the time, I agreed to write something down that might be of assistance in connection with both of these problems.

The attached memorandum contains the comments I have to make. The first part of the memorandum dealing with investment priorities and investment allocation may not be entirely clear, and I would suggest that if it is not clear it might be a good idea to arrange a seminar meeting for perhaps one hour to discuss and clarify it further.

(s)

Charles Wolf, Jr.

**Attachment**

**cc:** Honorable Tae Wan Son  
Dr. Kyun Hi Tchah  
Mr. Daniel Kie Hong Lee

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## SOME COMMENTS ON INVESTMENT PRIORITIES

### 1. Investment Priorities

The problem of determining investment priorities is essentially a problem of determining the relative social benefits and costs of alternative projects, or industries, so that the limited inputs that are available can be allocated to those industries or projects with the highest net social yield. There are many aspects to this problem which are not amenable to simple microeconomic analysis, for example:

- a. Different industries have differing time-patterns of output and yield. Some are quick yielding, like textiles; others, like railroads or steel, or power, bring returns that may be spread unevenly, uncertainly, and over a longer period. Comparing such differing industries requires both a precise knowledge of the time-patterns, and a planner's time-discount to permit intertemporal comparisons, neither of which is easy to estimate.
- b. Because of inter-industry complementarities, the returns from a particular industry may depend on what *other* industries are also going to be established. The *net* returns from a fertilizer plant may, for instance, be sensitive to whether or not it supplies its own power, or is built in conjunction with a hydro or thermal power project. Alternative industrial "*packages*" may be more appropriate for comparison, rather than alternative industries.

Still, there is much to be said for micro-economic investment criteria. Managerial and resource limitations often preclude an elaborate inter-industry "package" approach, particularly in the early stages of development when these limitations may be most acute. Much developmental investment, particularly if financed through government lending institutions, like the KRB, in conjunction with private financial participation, is *bound* to be on the basis of separate industries and projects. Moreover, in many under-developed countries, tangible progress in the short-term or medium-term is essential, so that projects with uncertain, long-term yields may just have to be deferred. For all these reasons, it is highly important in development planning to have sensible and consistent micro-economic investment criteria.

Let me turn now to the EDC's formula for determining investment priorities. I believe it is a useful first-step in the direction of rational micro-economic criteria. However, from the standpoint of its use as a guide to investment allocation, there are several shortcomings—some minor and some major—in this formula. Together, the shortcomings could lead to serious mistakes in allocation. The EDC formula for Investment Priority (I.P.) of individual industries is:

$$(1) \text{ I.P.} = V_d + V_s + V_e + V_w.$$

Where  $V_d$  = value of output less cost of imported materials,

$V_s$  = foreign exchange savings,

$V_e$  = foreign exchange earnings,

- $V_w$  = "employment effect",
- (2)  $V_w = w(V_d + V_s + V_e)$ ,  
 $w = W/P$ , where  $W$  = wages  
and  $P$  = value of output.

To indicate what I believe the errors to be, let me first add some variables to the EDC list shown above.

$M_d$  = cost of domestic materials and utilities services (e.g. power, transport) used in production.

$M_f$  = cost of imported materials used in production.

$r$  = interest, rent, insurance, and indirect taxes.

$c$  = capital consumption (depreciation, repairs and maintenance).

$p$  = profits before taxes.

$K$  = fixed capital and inventories.

Using these terms as well as those in the EDC formula, the total value of output can be expressed as:

(3)  $P = M_d + M_f + W + r + c + p$

(4) and  $V_d = P - M_f$

The EDC formula, (1), presents several difficulties. First, it arrives at a priority measure, in *Hwan*, without expressing the result in relation to investment costs,  $K$ . This can lead to obvious errors. Industry  $x_1$ , for example, may generate a *hwan* value of  $(V_d + V_s + V_e + V_w)$  *twice* as great as another industry  $x_2$ , but its capital costs may be *three* times as great. Clearly,  $x_2$  should be preferred to  $x_1$ , but (1) would accord priority to  $x_1$ .

Second, there are also some problems raised by the separate components of (1). Consider  $V_d$ , as defined in (4).  $V_d$  involves a subtraction of imported materials from the value of output, but *not* of domestic materials *or* wages. The economic meaning of  $V_d$  in the investment priority formula is that the "opportunity cost", (i.e. the value in alternative uses) of domestic materials and domestic labor is zero. This may be true for labor; it certainly isn't true for domestic materials and utilities. That the use of  $V_d$  may lead to inefficient allocative decisions can be seen by the following example. Assume that two industries  $x_1$  and  $x_2$  are alike in every respect except for two differences between them:

(a) The value of output minus import costs ( $= V_d$ ) of  $x_1$  exceeds that for  $x_2$  by 100,000 *hwan*;

(b) The value of power consumed by  $x_1$  exceeds that consumed by  $x_2$  by 200,000 *hwan*.

Clearly,  $x_2$  should be preferred to  $x_1$ , but the I.P. formula will accord priority to  $x_1$ .

The formula creates other similar troubles, as well. Instead of laboring the point further, let me suggest an alternative. An expression for investment priorities using "shadow" or accounting prices to estimate the social marginal productivity of capital, (i.e. the net contribution to value-added of investment in a particular industry or project), is:

$$(5) \quad IP = \frac{P - \alpha M_d - \beta M_f - \gamma W + (\beta - 1)(V_1 + V_2) - c}{K}$$

Where  $\alpha$  = ratio between social costs of domestic materials and market costs, i.e.  $\alpha$  indicates the relative extent to which domestic are *underpriced*;  $\alpha = 1$  would mean that social and market costs of domestic materials are equal.

$\beta$  = ratio between costs of imported materials under an "equilibrium" exchange rate and actual market costs, i.e.  $\beta$  indicates the relative *overvaluation* of the exchange rate, or the relative extent to which imported materials are *underpriced*;  $\beta = 2$  would mean that the equilibrium exchange rate is estimated at twice the 1,300 Hwan/dollar rate, or that imported materials cost half what they would cost at an equilibrium rate.

$\gamma$  = ratio between social costs (i.e. "opportunity costs") of labor and the prevailing market price of labor, i.e.  $\gamma$  measures the proportion between the marginal productivity of labor and the prevailing wage rate.  $\gamma = 0$  would mean that the marginal productivity of labor is zero.  $\gamma = -1$  would mean that the marginal productivity is *negative* in sign, and equal in absolute value to the wage rate. (For whatever it may be worth, on the basis of my two-weeks' impressions in Korea, I will guess at values for the three parameters as follows:

$$1 < \alpha < 1.5$$

$$\beta = 2$$

$$\gamma = 0$$

I would emphasize that these values are merely guesses. They have some impressionistic basis and I would be willing to argue for them — but not very strongly).

In (5), the use of  $(\beta - 1)$  to weight  $(V_1 + V_2)$  implies that where the exchange rate is at an equilibrium level, i.e.  $\beta = 1$ , no additional adjustment needs to be made for the balance of payments effects of output. But where the equilibrium exchange rate exceeds the existing rate, ( $\beta > 1$ ), an addition to P is needed to allow for balance of payments effects.

Subtracting capital consumption, c, and dividing the result by capital costs, K, gives an approximate measure of the relative social marginal productivity of investment, adjusted to take account of divergences between social and private costs. I would suggest that this might be a practical and useful device to help determine investment priorities among industries and projects, and to help allocate both government investment, and government funds and counterpart provided through the KRB for private investment.

## 2. Profit Ratios

At the March 13 meeting with EDC, I was given a table entitled, "Profit Ratios for Detailed Industries; Korea, 1958." The profit ratios listed in that table were calculated as a percentage of sales, and I mentioned at the time that, from the standpoint of investment allocation and development planning, it was more relevant to consider profit



in relation to capital investment rather than profit in relation to sales. The following equations show how profit in relation to sales can be simply converted into profit in relation to investment provide that the average capital-output ratio is known or can be approximately estimated for each industry.

Let  $S$  = sales

$V$  = value added

$w$  = wages

$m$  = materials and other non-wage costs of production

$p$  = profits

$\alpha$  = average capital/output ratio =  $K/V$ , where  $K$  = fixed capital (plant and equipment) + inventories

$P$  = profitability as yield on sales ("profit ratio") =  $p/S$

$P'$  = profitability as yield on fixed capital + inventories =  $p/K$

Definitions:

$$(1) S = m + w + p$$

$$(2) V = S - m = w + p$$

Since

$$(3) P/\alpha = \frac{P}{S} / \frac{K}{V}$$

It follows that

$$(4) P' = \frac{p}{K} = \frac{P}{\alpha} / \frac{S}{V}$$