KOREAN INDUSTRIAL POLICY

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Industrialisation needs to be nourished by means of industrial policy. This paper examines the Korean experience, reporting on the course of industrialisation, the choice of technology, the structure of industry, and the application of controls. The effectiveness of industrial actions in Korea is compared with that in other developing countries. The paper concludes by inferring the principles that have directed the Korean process of industrialisation: maximising the rate of growth of capacity in industry, maintaining a reasonably stable distribution of disposable income, domesticating industry, retaining control over the allocation of investment, regulating both the structure of each industry and the conduct of its constituent firms, and atomising extra-governmental power.

Keywords: Korea, industrial policy, industrialisation, joint ventures, jaebul, choice of technology

INTRODUCTION

As countries develop, commercialisation and bureaucratisation seem to proceed effortlessly, but industrialisation needs to be nourished. Countries that are attempting to industrialise usually have some governing principles, formulate some plan or programme, and follow some course of action that they hope will provide the nourishment; such principles, plans and actions comprise those countries' industrial policies. Our purpose in this article is to discover the industrial policy of one developing country, the Republic of Korea (henceforth to be abbreviated as Korea).

The chief aid to the discovery of Korea's industrial policy is our own research, conducted there over a period of several years and culminating in a book just published.[1] The focus of this research was the adoption, absorption and diffusion of modern technology within the industrial sector of the country; it is complemented by the work carried out simultaneously at the World Bank on Korea's industrialisation, more broadly defined,[2] at Harvard University on Korea's overall economic and social development,[3] and by still other scholars' inquiries into the specific role of the Korean government.[4]

The short trip of discovery of Korea's industrial policy will commence with a display of the methodological baggage taken on board. There will then be a logging of the route followed to Korea's present industrialised state, followed by a comparison of the alternative routes that could have been plotted. Finally, Korea's policy will be inferred from the course and conduct of the voyage.

APPROACH

The governments of most developing countries articulate policies. These policies are conceived over time, enacted in legislation, incorporated in administrative agencies, formalised in procedures and conveniently summarised in national plans and programmes. They are supposed to inspire purpose and to guide actions; they occasionally do.

To those investigating the achievements of the developing countries, their stated policies can offer a point of reference, against which performance can be measured. If articulated policy and performance are identical, if intentions and actions coincide, conclusions are easily drawn; but if, as so often happens, policy and performance deviate, conclusions are very difficult to draw. There are so many possible reasons for deviations between articulated policy and performance — unexpected changes in exogenous factors, unresolved conflicts between actors, infeasibility, inefficiency — that the contributors cannot be identified with confidence. Most explanations seem plausible, and each has its advocates.

Yet, articulated policy is the hypothesis with which the evidence provided by performance is usually confronted. Perhaps this is the wrong approach; perhaps this is testing the wrong hypothesis. It is always possible that the policy articulated is an ostensible policy only, fronting for a hidden one. The hidden policy may well be the real policy, real in the sense that it is the hidden policy that provides the governing principles, that underlies plans, that motivates actions. If so, the articulated policy is only a subterfuge, and would be expected to deviate from the outcome. Evidence would controvert it, not because of changes in exogenous factors, or unresolved conflicts, or infeasibility, or inefficiency, but because the policy that generated the evidence was not the policy being evaluated. The same evidence would not controvert the real policy.

One might then ask, "What is the real policy, if it is not the policy articulated?" Occasionally, this question is asked at the outset of an inquiry; on such occasions a tentative answer is provided, which is subsequently confronted with the facts: this is the procedure followed in criminal prosecutions, in which assertions are made by prosecuting attorneys, evidence supporting and attacking the assertions is submitted, and a judge or jury decides upon their consistency.

Although we shall ask a rather similar question to "What is the real policy?", we will not ask it at the outset, but at the end, after the evidence has been presented. Then the question will be inferential rather than direct, of the form, "Presuming that what we have observed was rational behaviour, what policy could this behaviour

have been designed to achieve?'' This policy we infer to be the real policy, since the observed actions could have been its logical outcome.

We could call this the 'inferred-objective' or the 'consistent-motivational' approach, for it proceeds by induction, from the evidence to a consistent hypothesis. The disadvantages of such an approach are that it discards a carefully composed body of material (the articulated policy) and that it is unable to discriminate between alternative hypotheses each of which *is* consistent with the evidence. Its great advantage, to this author at least, is that it enables the investigator to apply those two tools that have proved to be so powerful in the formulation of economic theory — rationality and optimality.

The approach involving inference as to real policies can be seen as a sequence of four tasks, the last of which is a logical operation capable of being expressed mathematically. The first task is to focus upon an issue or a problem, say, the identification of a nation's industrial policy, and to specify all the data that are relevant to its investigation. The second task is to observe all these data: data such as rules and procedures, possible alternative choices, administrative interventions and decisions, economic and technical outcomes, rewards and penalties. The third task is to generalise from all these observations, in order to guess what is the standard mode of behaviour; and the final task is to determine for what policy or policies this standard mode of behaviour is optimal.[5]

THE STANDARD MODE OF BEHAVIOUR

The issue that was focused on at the beginning of our research project was the adoption of modern industrial technology by Korea; this and the relevant data are reported in our monograph and will not be repeated here.[6] What will be described are the generalisations that were made — the standard mode of behaviour — and the chief alternatives — different modes of behaviour observed in other developing countries. We were interested not only in what the Koreans did, but also in what the Koreans might otherwise have done.

Although the Korean mode of behaviour is an interwoven fabric, taut and sturdy because evenly tensioned and reinforced, we shall separate it into four strands for easier description. Summarised, they are the course of industrialisation, the choice of technology, the structure of industry, and the application of controls. The course of industrialisation has moved from light industry to heavy, from labour-intensive to capital-intensive techniques, from relatively simple technologies (but with increasingly sophisticated design and marketing attributes) to complex technologies, and from external reliance to self-

sufficiency. Throughout, generally, costs have been held down, prices have approximated those in world markets (with the chief exception of the price of capital to those activities assigned priority), inputs (imported raw materials, spares, utilities, transport and technically-trained persons) have been made available as needed, government policy has remained steady and consistent, and targets have been reached. As the economy has grown, the scale of plants and firms has increased, both in absolute terms and relative to the scales existing contemporaneously in developed countries. Additions to industrial capacity have been timed to come into operation when the demand for their products has materialised, temporary short-falls being met by imports; in other words, the Koreans have built up to current demand, not ahead of it. Plant has been generally operated at its maximum rate of output from the start, inputs and outputs being allocated by government, and prices set by government. Over time, improvements in operations have been made, reducing average costs at a rate more or less equal to that attained in developed countries.

Korea has followed the above course of industrialisation applying throughout the state of arts current in developed countries. Rather than choose technologies appropriate at relative factor prices existing as of the date of choice, the country has chosen technologies appropriate at relative factor prices expected to be ruling one, two or even three decades into the future. Since the real price of labour has been expected approximately to double each decade, and has actually done so, the choice of technologies being employed in developed countries, albeit with their higher labour costs, has not been entirely inappropriate.

At least as significant as the choice of technology has been Korea's determination to extract the best terms on which technology is supplied from abroad. Recognising that there are several potential foreign suppliers of any given technology — manufacturers, construction firms, process design firms — the Koreans have generally made contact with all the candidates, commencing negotiations simultaneously. As negotiations proceeded, the terms the foreign candidates faced became more severe, until finally only a single potential supplier remained in the running, willing to accept the most severe terms of all. By this monopsonistic practice, the Korean government has secured the technologies not only at modest royalty rates, but, perhaps more importantly, along with commitments by the foreign firm to train technicians, engineers and managers, both in Korea and at the suppliers' own plants, to share all improvements made throughout the effective lives of the technologies, and to provide speedy access to inputs and permit widespread disposal of outputs. Thus, ranking with the choice of technology in significance has been the choice of supplier.

Having chosen the latest technique in operation in developed countries and having incorporated it in plants of moderately large size (so as to exploit scale economies), Korea thereby predetermined the intermediate structure of industry. Initially, most industries, narrowly defined in this sense of employing a single modern technology, consisted of a few private manufacturing firms employing primitive techniques on a small scale. Importers provided more modern goods from abroad, and large public and private firms in peripheral industries were reservoirs of scarce talents and capital. From among these participants the Korean government could have nominated, and occasionally did, one firm to be the vehicle for the employment of the new technology. More frequently, the government, in conjunction with the foreign supplier, established a joint venture whose equity and management were shared equally and whose debt was raised abroad, the foreign suppliers having provided access and assurances to financial institutions. Rarely, when no foreign firm was willing to supply the technology on terms sufficiently advantageous to the country, a wholly-Korean firm was created, which subsequently took out a straight-forward license to produce. Equally rarely, at the government's command, one of the large Korean conglomerates, the so called *jaebul*, moved into the industry from a nearby vantage point.

At this intermediate stage in its development, the industry consisted of one medium- to large-sized firm employing the modern technology and several much small firms employing older technologies. The large firm produced a narrow range of homogeneous products, the small firms a wide range of different products of varying quality. During the years that this intermediate stage has lasted, anywhere from a few to over a decade, the outputs of both sizes of firm have grown, that of the large firm at a much faster rate when the domestic market has permitted it to replicate its original plant. The Korean government has often encouraged the creation and expansion of the firm employing the modern technology by providing capital at subsidised rates; the small firms have had to finance their expansions with retained earnings.

Many Korean industries still occupy this intermediate stage, but a few have advanced to what may be the final stage, in which one or more large firms in other industries have been permitted to enter as rivals to the established firm. The more successful the established firm has been in meeting its output and cost targets, the less likely is subsequent entry to occur.

In the intermediate or final stages, the ownership of the firm employing the modern technology has occasionally changed, joint ventures becoming wholly Korean owned, and unprofitable ventures being absorbed by one of the *jaebul*. Since ventures that were unprofitable initially at market prices have often continued to be

unprofitable, their absorption has involved cross-subsidisation financed by the *jaebul's* profitable operations, leading, as far as the *jaebul* was concerned, to a misallocation of resources. When the government, valuing the inputs and outputs of the unprofitable operation at shadow prices, has deemed it not to involve a misallocation of resources economy-wide, it has required the continuance of the cross-subsidisation. The *jaebul* has paid a price for its right to earn often substantial profits in its other endeavours.

This forcing of firms to absorb and maintain unprofitable ventures in the national interest is one of the controls that the Korean government has exerted upon industry. It has not been the only one, nor even the only intimidating one. Others of this ilk have been discrimination among firms within an industry, favouring those which conform to the government's expectations on rates of output, product quality, shifting of sources of supply from foreign to domestic firms, technical training, new product development, etc., and punishing those which fail to fulfil expectations. The instruments used have been allocation of firms' output to customers (particularly telling when, as has occasionally happened, market demand for the industry's product has been less than total capacity, so that the disfavoured firms have been unable to sell all they were capable of producing), the setting of prices of domestically produced goods and tariffs upon imported goods (the government has tended to set prices and tariffs high until production employing the modern technology has reached the rate for which the equipment was designed, after which both prices and tariffs have been sharply reduced to the levels governing in world markets: infant industries have had to mature), the elimination of subsidies to inputs (particularly to borrowed capital, a potent instrument in regulating the behaviour of the generally highly-geared Korean firms), and the threat of the entry of rivals.

That the Korean government has succeeded in applying controls of such breadth and power seems, to this author, to have come about for three main reasons, two of which have been attitudinal and the third of which has been positional. First, the government itself has appeared to Koreans to be dedicated to the country's economic development. One and all, its leaders have committed themselves publicly to the struggle for growth and to the acceptance of any sacrifices necessary in its furtherance. The elimination of memories of dependence upon foreign powers, the necessity to stand strong in the face of threats from the north, and the desire to display the innate talents of the country's citizens in the pursuit of national objectives have been sufficient spurs for the commitment. That such a commitment on the part of a country's leaders has been demonstrated to be closely correlated with more rapid economic growth is known;[7]

that Korea's leaders have exhibited this commitment is evident to observers of the country's recent history.

Secondly, the attitudes of most Korean citizens towards their government has appeared to be an acceptance of its objectives and a willingness to conform to its decrees. A government can more readily secure compliance to its orders if its citizenry is equally devoted to the national interest and recognises that government as the legitimate instrument of that interest.

The third main reason for the ability of the Korean government to apply controls of such breadth and power is its omnipresence on the economic scene. Through the agency of its ministers and civil servants, employed in the Economic Planning Board, the various departments and ancillary bodies, the government has populated the industrial environment. Having participated in planning, in negotiations with foreign suppliers, in establishing or directing firms to employ the imported technology; and in the procurement of finance, equipment and personnel; having been present during the construction of plant, during the start-up of equipment, and during its subsequent operation and improvement; the functionaries of government have become quickly aware of departures from schedules and deficiencies in material and manpower. It has been easier to impose controls, and those controls have been more effective, when the controllers have been always on the spot.

In fact, in initial applications of advanced technologies it is only the Korean government that has been on the spot throughout. Foreign suppliers have not taken part in national economic planning, nor have they maintained much presence after the equipment has been brought to full-scale operation; the firms that have employed the technology to manufacture products have not mounted the stage until after negotiations with the foreign supplier have been concluded; sellers of current inputs and buyers of outputs have appeared later still; only the government has written itself into every act.

ALTERNATIVE MODES OF BEHAVIOUR

What alternative modes of behaviour towards industrialisation might have been adopted in Korea is an impossible question to answer; one cannot be certain what might have been done instead of what was done. Given the commitment of the government to economic development, given the willingness of its servants to put the national interest before their private interests, given the responsiveness of its citizens, and given Korea's position in the international arena, the alternatives cannot have been too widely different from the actuality.

Perhaps the Koreans could have shifted their emphasis from light industry to heavy sooner, or later; perhaps they could have relied upon foreign technology and technicians less or more; perhaps they could have built their plants ahead of domestic demand, or well after domestic demand materialised: these might have been feasible alternatives. But to us the most nearly obvious alternatives concerned the scale and ownership of the manufacturing firms.

The vehicles Korea chose as the prime movers of industrialisation were chiefly medium-sized (by international standards) joint ventures with the foreign suppliers of the advanced technology. As far as scale was concerned, Korea could have chosen more ponderous vehicles, of a size equal to the largest moving in the developed countries; the consequences would have been greater difficulty in absorbing the technology and either a longer delay before sufficient domestic demand accumulated or a need to export a substantial fraction of the initial output of an earlier installation. We believe that the alternative of larger scale was better avoided.

The alternative of smaller scale would have had more to recommend it. A little easier to absorb on the initial installation, and far easier in numerous subsequent installations, the adoption of advanced technology would have been accompanied by less uncertainty. Moreover, the building of more plants, within the same total industry capacity, could have permitted the creation of more firms and thereby greater prospect for competition. Offsetting these possible advantages would have been the disadvantage of the stretching of public resources over a larger number of installations. The Korean government's urge to intervene in the economy would not have been any the less, but its ability to intervene expeditiously and effectively might have been.

More firms could have meant simply more joint ventures, provided additional foreign suppliers could have been recruited. Recruitment would have been more difficult, potential suppliers being less eager to enter into production if unable to exploit economies of scale, and the terms of contracts negotiated would have been less favourable, on the average, to Korea. Alternatively, more firms could have meant greater foreign ownership, less Korean control, and a different pattern of capital flow (a greater foreign capital inflow in the early years, and a greater outflow in the later years).

AN ESTIMATE OF THE MERITS OF THE STANDARD MODE OF BEHAVIOUR

Lists of advantages and disadvantages of alternative modes of behaviour may be suggestive, but they are hardly comparable. Since each list comprises many factors of different dimension, they cannot

easily be aggregated: simply to add them up, concluding that there are, say, four factors in favour of an alternative and six opposed, is not to produce a revealing result. What we will attempt in this section is not a simple aggregation, but a calculation designed to measure the effectiveness of Korea's industrial actions. It is, to be sure, only an arithmetical exercise, but it does yield comparable results and it does capture, so we believe, the essence of the standard mode of behaviour in Korea.

In one of the pans of the comparative scale is the standard mode of Korea; in the other pan is not any of the plausible alternatives mentioned in the previous section of this paper, but the alternative mode of behaviour observed in many other developing countries, particularly some of those of Latin America, the Middle East and South-East Asia. Elsewhere, when analysing the adoption of new technologies in developing countries, we have called this mode of behaviour the 'conspiratorial choice';[8] its characteristics will become evident as we describe the basis upon which the calculations are made.

The comparison will involve estimating the internal rate of return for two nearly identical industrial projects, differing only in their location. The Korean project will be assumed to require a capital outlay of 400 monetary units, spread equally over the first two years of the project's life. The project in the other developing country will be assumed to require a capital outlay of 480 units, higher by 10 per cent because of tribute paid to the country's rulers (in the first year of the project's life) and by another 10 per cent because of the country's failure to negotiate the most beneficial terms (this increment to be spread over the first two years of the project's life). The appropriate figures for capital costs are entered in the first rows of Table 1 (for Korea) and Table 2 (for the other developing country).

With capital, other inputs are employed in the design, construction and operation of the plant, lumped into 'labour', which is applied throughout, and 'raw materials', which are applied once production begins. Labour costs in the Korean project are assumed to be 20 monetary units annually, and in the other project 24 units annually, the increase being attributed to the greater employment of expatriates. Raw material costs are assumed to be a linear function of the rate of output, and raw material prices to be equal for each country; at design capacity raw materials are assumed to represent 40 per cent of total costs (labour 20 per cent and depreciation of the capital cost over ten years the remaining 40 per cent). Expenditures on labour and raw materials are listed in the second and third rows of Tables 1 and 2.

There is evidence to support the hypothesis that the Korean mode of behaviour leads to marked shortening of the gestation period, the interval between the conception of the project and the first operation of the equipment, and including the stages of process design,

TABLE 1

Data Underlying the Calculation of the Internal Rate of Return for a Project Undertaken According to the Korean Mode of Production

Year	1	2	3	4	5	6	7	8	9	10	1-10 (total)
Item:											
Costs											
Capital	200	200	—	—	—	—	—	—	—	—	400
Labour	20	20	20	20	20	20	20	20	20	20	200
Raw materials	—	—	36	40	42	44	46	48	50	52	360
Total costs	220	220	56	60	62	64	66	68	70	72	960
Output	—	—	90	100	105	110	115	120	125	130	895
Revenues	—	—	214	237	249	261	273	285	297	309	2,124
Revenues minus costs (undiscounted)	-220	-220	+156	+177	+187	+197	+207	+217	+227	+237	1,164
Internal rate of return — per cent											31

TABLE 2

Data Underlying the Calculation of the Internal Rate of Return for a Project Undertaken According to the Mode of Production Apparent in Many Other Developing Countries

Year	1	2	3	4	5	6	7	8	9	10	1-10 (total)
Item:											
Costs											
Capital	260	220	—	—	—	—	—	—	—	—	480
Labour	24	24	24	24	24	24	24	24	24	24	240
Raw materials	—	—	—	12	20	30	30	30	30	30	182
Total costs	284	244	24	36	44	54	54	54	54	54	902
Output	—	—	—	30	50	60	60	60	60	60	380
Revenues	—	—	—	72	119	142	142	142	142	142	902
Revenues minus costs (undiscounted)	-284	-244	-24	+36	+75	+88	+88	+88	+88	+88	0
Internal rate of return — per cent											0

equipment design and procurement, construction, training of operatives, installation and start-up. We have assumed a two-year gestation period for the Korean project, *versus* a three-year period in the other developing country. There is evidence to support the further hypothesis that the Korean mode leads to higher rates of output, relative to design capacity, than the mode in other developing countries. Adopting this hypothesis, we have assumed the following paths of production: in Korea, output at 90 per cent of design capacity in year 3, and 100 per cent in year 4; in the other developing country, output of 30 per cent of design capacity in year 4 (after the extra year's gestation), 50 per cent in year 5, and 60 per cent in years 6 through 10.

A third hypothesis can be derived from the Korean experience, namely that the Korean mode of behaviour leads to steady improvements in operation throughout the effective life of the plant. The major form these improvements take is successively higher rates of output, beyond that designed, from existing equipment. Unit costs thereby fall, as this increasing output is spread over the fixed quantities of capital and labour. We assume that after reaching design capacity (100 units per year) in year 4, production from the existing equipment increases to 105 units in year 5, 110 in year 6, and a further five units each succeeding year. Output from the equipment in the other developing country is assumed to remain stagnant at 60 units in all years after year 6. The rates of output are listed in the fifth row of Tables 1 and 2.

The final assumption covers the price of the product, which, when multiplied by the annual rate of output, yields total revenues (see the next rows in Tables 1 and 2). We have assumed that the price of the product is identical in both countries, stable through time, and just sufficient to enable the project in the other developing country to break even. This arbitrary price turns out to be 2.37 monetary units per unit of output, and enables total revenues over the life of the project — 902 monetary units — exactly to balance total costs. In other words, at this price, the internal rate of return to the project in the other developing country is zero per cent. The total stream of revenues, discounted at zero per cent, is exactly equal to the discounted stream of costs, discounted also at zero per cent.

What internal rate of return is earned by the Korean project? The answer is just over 30 per cent. Those resources whose utilisation provides no return above their own cost in the other developing country, yield an extra 30 per cent per year when utilised in the Korean mode.

Other summary measures can be provided in comparison. When undertaken in Korea, the project has a capital:output ratio of approximately 1.7; in the other developing country it is 3.4. The capital:labour ratio is the same in Korea as in the other developing

country, but under the Korean mode of production the productivity of labour is nearly three times as great. Whatever index we use, the Korean mode of production is superior.

INFERENCES AS TO KOREAN INDUSTRIAL POLICY

Our purpose in this paper is, however, not to argue that Korea has been successful in its industrialisation, but to infer, *via* a generalisation of the country's industrial experience, what policy has been its guide. We wish to infer what principles have directed the process of industrialisation.

It seems to us that events in Korea have generally been consistent with six principles. Three of these principles concerned the course of industrial development, three the means that the government has used to direct this course. The first principle can be stated simply as maximising the rate of growth of capacity in Korean industry. This principle is not necessarily the same as maximising the rate of growth of output, or income, or consumption, although the maintenance of near full-capacity operation has meant that effectively the rates of growth of output and income have been maximised too. Consumption, in the short run, has been sacrificed so as to permit the high rates of savings, investment and consequently capacity growth.

A second principle has been to maintain a reasonably stable distribution of disposable income, between sectors, and among individuals. The rapid growth of industry has provided employment for much of the labour force formerly engaged in agriculture, and shifts in the terms of trade between agricultural and industrial goods in favour of the former have ensured that the residual labour force in agriculture has prospered too. This does not necessarily mean that the government has attempted to keep stable the distribution of wealth, as usually defined: this matter will be returned to when we consider the sixth and final principle.

The third principle that we infer from the behaviour of the Korean government has been that of domesticating industry. Several of the joint ventures originally with foreign participation have become wholly Korean owned, always with the compliance and occasionally with the connivance of the government; and foreign engineers, technicians and managers have been replaced with Koreans, always deliberately and systematically. The objective appears to have been to ensure that control over the Korean economy, and industry particularly, rests in the hands of Koreans.

The last three — fourth, fifth and sixth — principles refer to just whose hands are to hold the power; all imply that those hands are the extremities of government. The first of these three has been a determination to retain control over the allocation of investment,

specifying what changes have occurred in the availability of inputs (particularly education), in technology, in location of industry and in overall economic structure. The second has been to regulate both the structure of each industry and the conduct of its constituent firms. Public or private, single-firm monopoly or oligopoly with a competitive fringe: these have been the Korean government's chief alternatives to structure; to conduct there has been no alternative to production at the maximum rate.

If the fourth and fifth principles refer indirectly to the retention of power by the Korean government, the sixth and final principle refers directly to its retention: it is that the government has been motivated by the objective of atomising extra-governmental power. Stated more succinctly, the principle has been to maintain the primacy of government in the economic sphere. To be sure, wealth has been amassed in some private hands, but this is to be expected in a capitalistic economy that has generated so much productive capacity so rapidly. What is not to be expected is that this wealth has been accumulated with the government's consent, and remains on the government's sufferance. If it has ever appeared that claims to private wealth are being used to create a centre of power independent of government, those claims are invalidated. Claims to wealth have been flimsy documents in Korea when that wealth has been used in anything other than the national interest. The government has been vigilant in applying the principle that interests other than the national interest shall not become vested.

This completes the list of principles which we believe have guided the Korean government during the last quarter century. They have been inferred from observations of actions and events within Korea, and have been generalised into a standard mode of behaviour, with which the six principles are consistent. Whether these six principles constitute an entire industrial policy we cannot say, for no one knows, in the abstract, what a complete industrial policy is. Ideally, the complete industrial policy would contain a principle, or a rule, to govern every possible situation; but such a policy would be hopelessly complex. Our abbreviated policy, combined with detailed economic planning on the government's side and a willingness to comply on the populace's side, seems to us to have covered most of the situations that have arisen in Korea's phenomenal industrial development.

NOTES AND REFERENCES

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2. See, e.g., L.E. Westphal, 'Manufacturing' in P. Hasan and D.C. Rao, (eds), *Korea: Policy Issues for Long-Term Development,* Johns Hopkins for the World Bank, Baltimore, 1979, pp. 233-80; and subsequent World Bank papers by Amsden, Dahlen, Kim and Westphal.
3. See L.P. Jones and I. SaKong, *Government, Business and Entrepreneurship in Economic Development: The Korean Case,* Council on East Asian Studies in the Modernization of the Republic of Korea: 1945-1975, Harvard University, Cambridge, Mass., 1980.
4. Introduced in R. Wade and G. White (eds), 'Developmental states in East Asia: capitalist and socialist', *Bulletin of the Institute of Development Studies,* University of Sussex, April 1984; see also L.L. Wade and B.S. Kim, *Economic Development of South Korea: The Political Economy of Success,* Praeger, New York, 1978.
5. If the standard mode of behaviour can be expressed in mathematical form (as a specific function), it may be possible to determine what objective or objectives (again expressed in mathematical form, as a functional) the standard mode of behaviour will optimise. The mathematics employed is optimal control theory (see, e.g., A.E. Bryson and Y.-C. Ho, *Applied Optimal Control,* John Wiley, New York, 1975.), but the method of employing it is the reverse of what is common. Commonly, one formulates mathematically the objective as an integral equation and then determines the specific function which will maximise (or minimise) the functional; in the inferential approach one takes the specific function (representing the standard mode of behaviour) and determines what integral equation(s) it maximises (or minimises). Mathematically this is the more difficult operation, but conceptually it is merely the obverse of the customary approach.
6. Park and Enos, *op. cit.*
7. See I. Adelman and C.T. Morris, 'Performance criteria for evaluating economic development', *Quarterly Journal of Economics,* 82, 2, 1968, pp. 260-80.
8. J.L. Enos, 'A game-theoretic approach to choice of technology in developing countries' in J. James and S. Watanabe (eds), *Technology, Institutions and Government Policies,* Macmillan, London, 1984, pp. 47-79.