Explorations

Chapter 2

Growth Models and Development Processes

The Economics of Growth—Help or Hindrance?

One of the astounding feats of modern economics is the way in which the analysis of the growth process of advanced industrial countries has yielded an apparatus of seemingly ready applicability to the most primitive economies. This is the kind of "external economies" which accrue frequently in the course of scientific progress: one branch profits from the discoveries and insights of another. In principle, therefore, there is nothing reprehensible in the attempt to make our underdeveloped "economics of development" benefit from the recent vigorous advances of the "economics of growth."  

But in the social sciences we must be more than ordinarily suspicious of such short-cuts. The reason is that theories which, because of their high level of abstraction, look perfectly "neutral" as between one kind of economic system and another, often are primarily relevant to the conditions under which they were conceived. They usually originate in attempts to illuminate possible solutions to specific problems encountered at a given time, and are sometimes directly designed to do so. If they are useful theories, they will have focused on variables that in a particular setting are both strategic and subject to change by policy-makers. Therefore, the more useful they are in one setting, the less they are likely to be so in a completely different one. An attempt to "apply" them nevertheless may turn out to be a lengthy detour rather than a short cut. For, as we have become used to looking at reality through certain theoretical glasses, we may for a long time be unable to see it as it really is.

The attempt to apply the economics of growth to the economics of development may be a case in point. The economics of growth, whose

1. We are applying the first term to underdeveloped and the second to economically advanced countries.

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principal originators are Harrod and Domar, grew directly out of the stagnation and postwar slump fears of the late thirties and World War II. From the point of view of the history of ideas, they are of course filial descendants of the Keynesian system, even though they have achieved considerable advances over that system in several respects.²

Domar's system has many appeals not the least of which is its basic simplicity. A society has a certain income, \( Y \). A portion \( sY \) of this income is saved and, in equilibrium, invested: \( I = sY \) where \( s \) is the propensity to save. This investment results in new capacity. If this capacity is fully utilized, the resulting increase in production and, hence, income per unit of time is \( \dot{Y} = \frac{I}{k} \) where \( k \) is the capital-output ratio. Therefore \( \dot{Y} = Y \cdot \frac{s}{k} \) and \( \frac{\dot{Y}}{Y} = \frac{s}{k} \), which means that income will have to grow at a rate equal to the quotient of the propensity to save by the capital-output ratio if capacity is to be fully utilized and if savings-investment equilibrium is to prevail. Of course, this summary does not do justice to many aspects of Domar's incisive thought, but in its bare outline this is the theory. The best measure of its success is that today we must pinch ourselves to remember that it is theory rather than a faithful photographic copy of reality.

Harrod has focused attention on an additional relationship which has proven more elusive. While Domar is satisfied to relate investment forward to the increase in income that will have to be achieved if the additional capacity resulting from investment is to be utilized, Harrod stresses the way in which investment can be traced back to the rate of increase in output (and hence income) that is being experienced by the entrepreneurs. While recognizing the technological relationship between capital formation and subsequent full-capacity output growth, he also posits a behavioral relationship between growth in demand and, hence, current output on the one hand and capital formation on the other.

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3. There have of course been major new contributions since the original articles of Harrod and Domar. My point is that the refinement, disaggregation, and qualification of their categories still sets the tone of the discussion.

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to make full use of the capacity created by new investment but, inversely, the required savings and capital-output ratios if income is to attain a certain target growth rate. In such exercises, the capital-output ratio is usually assumed at some value between 2.5 and 5; sometimes several alternative projections are undertaken; with given growth rates, over-all or per capita, and with given population projections in the latter case, total capital requirements for five- or ten-year plans are then easily derived.

Now, there is no harm in making these computations if all they are expected to yield is an approximate idea of the amount of capital that is likely to be used in the course of the growth process. But if one thinks that the functional relationships assumed in the model are a meaningful description of the development process, a point may be reached at which the model becomes a hindrance rather than a help in the understanding of the reality of underdeveloped countries.

In advanced economies, savings and investment decisions are independent of one another to a substantial extent and income per capita is one important determinant of the supply of savings. Therefore the equality between savings and investment is an equilibrium condition, and to write \( sY \) for \( S \) is a meaningful start in the analysis of typical savings behavior. In an underdeveloped economy, on the other hand, investment and savings decisions are largely interdependent. At the same time, additions to savings depend far more on the opening up of investment opportunities and on the removal of various obstacles to investment activity than on increased income.

Similarly, the capital-output ratio may on the whole be considered a technological coefficient in advanced countries where during any one period a variety of projects with some kind of balanced distribution of capital coefficients will come into existence. This is far less certain in underdeveloped countries where, moreover, "normal" productivity is often held back by shortages and bottlenecks and where their elimination may suddenly produce a considerable increase in the productivity of already invested capital.

For these reasons, a model based on the propensity to save and on the capital-output ratio is bound to be far less useful in underdeveloped than in advanced economies. Its predictive and operational value is low. It does not really tell us much about the key mechanisms through
by new investment but, input-output ratios if income is to such exercises, the capital-output value between 2.5 and 5; are undertaken; with given with given population projections for five- or ten-year computations if all they are of the amount of capital that growth process. But if one assumed in the model are a point process, a point may be dance rather than a help in developed countries.

Investment decisions are initial extent and income per e supply of savings. There is investment an equilibrium meaningful start in the analysis developed economy, on the decisions are largely idavings depend far more on ies and on the removal of an on increased income.

The whole be considered a tries where during any on of balanced distribution of e. This is far less certain in r, “normal” productivity is ks and where their elimination increase in the productivity propensity to save and on utility in underdeveloped re and operational value is the key mechanisms through which economic progress gets under way and is carried forward in a backward environment.

The reason for this state of affairs has already been mentioned: while the model appears to be quite general, its principal parameters have been chosen so as to give it maximum relevance within the environment with which it was intended to deal. But the very success of this enterprise makes it virtually certain that the model will have minimum relevance in any radically different environment. The economics of development dare not therefore borrow too extensively from the economics of growth; like the underdeveloped countries themselves, it must learn to walk on its own feet, which means that it must work out its own abstractions.

**Explaining Investment Activity**

The theory of investment has remained the most unsatisfactory aspect of the growth models of advanced economies. In spite of empirical studies and periodic surveys of investment programs of business firms, investment decisions have not been adequately explained by other observable economic variables. True, the relation between consumption and income has also turned out to be far more complex than was once thought, and that between investment and incremental output potential is certainly not a technological constant unaffected by such matters as relative factor prices, technological progress, etc. Nevertheless, investment is still comparatively the most volatile and least predictable among the more important variables that are involved in the growth process. Harrod, Hicks, and others have used the device of dividing ex ante investment into two parts: first, the “induced” portion, resulting from recent increases in demand or, somewhat more realistically, from past profits, and secondly “autonomous investment” which is described as principally influenced by new inventions, expectations, public overhead investments, etc. This is of course a helpful first step in sorting out the known from the unknown factors in the determination of investment. But as long as there remains an “autonomous” investment, i.e., a portion that cannot be convincing explained by economic variables, we are still without a comprehensive theory of investment. This is probably what Domar
sensed when he limited himself essentially to defining the rate of capital formation \textit{required for} steady growth, regardless of the question whether it is in fact likely to be achieved.

The lack of such a theory is not really much lamented. Any attempt at making investment a completely endogenous variable would not be received with great joy at the discovery of a missing link, but on the contrary would meet with much resistance and incredulity. For the notion that investment is subject to many unpredictable outside shocks is firmly rooted in our concept of the investment process in advanced industrial countries.

Exaggerating a little, we may describe this concept in the following terms: at any time, capitalist economies dispose of an ample supply of entrepreneurs who are especially trained in the art of perceiving and ferreting out economic opportunity: who know how to rank all available opportunities according to their profitability: and who can perform or procure everything that is needed to transform the projects into reality, provided only that “finance” is available to them at appropriate terms and conditions. Investors are thus pictured as a hungry lot that throw themselves on and devour any new investment opportunity that comes along. No wonder that the system is unstable and is alternatively suffering from deflation, because of a temporary exhaustion of investment opportunities, or from inflation, because of a temporary excess.

Naturally everything depends on the supply of investment opportunities. If these were to be forthcoming in a steady stream, the chance for investment to flow smoothly would be much increased. But since new inventions must be included among the determinants, and since various accelerators and decelerators are at work, the flow of investment will be far from even.

In the real world, the instability of investment is of course reduced by the fact that reactions to the appearance of investment opportunities are not instantaneous: in fact there is a considerable lag between invention and innovation and this lag is helpfully distributed over several years. Nevertheless, the resulting smoothing of the investment flow does not modify the process in its essentials. In the advanced industrial economies we cannot help feeling that investment is constantly living from hand to mouth. How much more confident we would be about the chances of these economies to maintain a steady
of technical progress!

This brings us of course straight back to our subject, the underdeveloped countries. They are in the “fortunate” position of facing a huge accumulated reservoir of technical progress on which they may draw steadily for many years to come. But their difficulty, on the other hand, lies with the processes that are largely taken for granted in advanced countries, namely, with the perception of investment opportunities and their transformation into actual investments.

With investment not depending on the uncertain appearance of a fresh supply of attractive investment opportunities, it may actually be easier to construct a theory of investment for them than for the advanced countries. This is fortunate, for any theory of development must start with a consideration of the forces that determine investment in underdeveloped countries, especially when it is realized that savings are no means the only limiting factor and may be low because investments are low rather than vice versa. Hemmed in between the simplifications of the growth models with their smooth exponential paths and the unnerving choppiness characteristic of the growth process in underdeveloped countries, current writings on development are almost devoid of attempts at building up a theoretical framework in answer to this question. One finds in them many valuable hints on how investment should proceed, on investment criteria useful for policy makers, but little systematic discussion of the forces that govern the process of capital accumulation. Perhaps all the knowledge we need and can hope to attain may indeed be summarized by the statement that investment depends on savings and a number of other factors, such as technical education, organizational know-how, presence of enterprising minorities, etc. Nevertheless, at the risk of attacking a trivial problem, we shall now attempt to go beyond this type of statement.

The Ability to Invest

In the theory of growth relating to advanced countries, attention is properly centered on two points: the generation of savings on the one hand, and the availability of investment opportunities and their productivity on the other. Since it is taken for granted that investment
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will automatically take place provided savings and investment opportunities are both available, it is only natural to focus on what are in effect the two terminal points of the savings-investment process.

In underdeveloped countries, such telescoping of the process would be highly unrealistic: the factors limiting growth are here most generally connected, not with the two terminal points themselves, but with the difficulties of connecting them. In other words, development is held back primarily by the difficulties of channeling existing or potentially existing savings into available productive investment opportunities, i.e., by a shortage of the ability to make and carry out development decisions. Some of the reasons for this shortage of what we shall call briefly the "ability to invest" were set out in the first chapter.

The ability to invest is acquired and increased primarily by practice; and the amount of practice depends in fact on the size of the modern sector of the economy. In other words, an economy secretes abilities, skills, and attitudes needed for further development roughly in proportion to the size of the sector where these abilities are already required and where these attitudes are being inculcated. For instance, in an economy with 1000 plants, about ten times as many managers and engineers can be expected to be available for the manning of new managerial and engineering jobs than in an economy with 100 plants. More intangible factors, such as the ability to promote new enterprises and to enlist cooperation for this purpose, the ability to perceive new opportunities and to act on them, may, in a first approximation, be supposed to be similarly related to their actual breeding ground.

We may therefore think of the ability to invest as a coefficient $v$ that, applied to the total income $Y_m$ of the economy's modern sector, yields the investment $v \cdot Y_m$ that can and will be undertaken provided the finance is available. The propensity to save, $s$, on the other hand, is the ratio of all savings to the total income of the economy, $Y$. Let us examine briefly the relationship between these quantities.

At an early stage of the developing country's growth, the investment volume permitted by the ability to invest is likely to be low, not necessarily because $v$ is low, but simply because $Y_m$ is small in relation to $Y$. We are up against one of the famous vicious circles: a modern sector is needed to generate investing ability and vice versa. Whether or not
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or not the distribution of income is very uneven, it is likely that total
mobilizable savings in such an economy exceed total investing capacity.
The excess may actually show up in unadulterated forms such as
hoarded gold or foreign exchange; more likely, an excess of potential
over actual savings may be indicated by luxury consumption of the
rich, by occasional large-scale spending and gifts even among the
poor, and by considerable amounts of time devoted to leisure and
similar phenomena ubiquitous in underdeveloped countries.

We have here the opposite of the "forced savings" concept which
describes the involuntary cut in consumption that is inflicted upon the
public at large when inflationary finance is made available to investors.
In underdeveloped countries, on the contrary, we may perhaps say
that a readiness to save and invest exists, but is being frustrated—or
at least this is how the situation might be characterized by someone
who would look back upon it after development has made important
forward strides. Of course, it is not easy to define this concept of
potential or frustrated savings; generally it just stands for what an
outside observer thinks should or might be saved. But as in the case of
disguised unemployment, a precise definition is not necessary; we
may say that frustrated savings exist whenever the total supply of
savings is highly responsive to the appearance of new investment op-
opportunities, again a condition characteristic of many underdeveloped
countries.

As the modern sector expands, \(v \cdot Y_m\) expands also and, provided \(v\)
is larger than \(s\), will eventually catch up with \(sY\). From that point on,
we are back at the traditional model, with the further expansion of
the economy essentially limited by the supply of savings and with the
latter responding more to increase in income than to the appearance of
new investment opportunities. Such opportunities then result primarily
in a reshuffling of the order in which investments will actually be
undertaken.

Clearly our "ability to invest" is closely related to what has some-
times been termed "absorptive capacity." It has of course been
realized that a country's capacity to absorb capital may be lower than
the investment funds available to it because of shortages of skills and

5. M. F. Millikan and W. W. Rostow, A Proposal: Key to an Effective Foreign
other obstacles. But this situation has always been considered a deviation from the norm, i.e., the full absorption of all available finance. In this fashion, attention has been centered on the removal of the various hindrances to absorption, an activity which is then detached from the purview of economic analysis and relegated to prehistory under the heading "laying down the prerequisites for economic development." In our opinion, it is more fruitful to investigate directly how investment activity is determined and grows in underdeveloped countries than to start with some preconceived idea of what it should be. For this reason, we prefer the term "ability to invest" which suggests a phenomenon that has an expansion path of its own. The path which we have traced thus far is a very schematic one. Nevertheless some implications are evident even at this stage of the argument.

"Only the capitalists save." Arthur Lewis has clearly seen that the growth of underdeveloped countries is held back by the smallness of the modern (capitalist) sector rather than by any absolute inability to save resulting from low income levels. However, he maintains savings in their traditional role as principal agent of growth; and since he wishes to relate growth to the size of the modern sector rather than to that of the whole economy he is naturally led to the "classical" proposition that only the capitalists save (or that only their savings count). But why not take one more step and rely for growth on the composite abilities produced by the modern sector which include, inter alia, the ability to mobilize the savings of the rest of the community? This course not only has the advantage of realism and simplicity; it also gives us a model of development that is applicable regardless of the economic system under which a country chooses to live.

The role of foreign capital. It is clear from our analysis that foreign capital plays two different roles in the course of the development process: in the first phase, when domestic savings are not the factor limiting development, foreign capital is needed not so much qua

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capital as because it brings with it certain abilities and skills that are in particularly short supply. This does not mean that the capital contribution should be necessarily and entirely divorced from the provision of skills and know-how, through licensing arrangements, management contracts, and the like. Certain abilities and attitudes are extremely hard to divorce from capital and yet are among those that it is most important to acquire for a developing country. An example is what has become known as “growth mentality,” which, among other things, stands for the plowing back of profits in substantial quantities rather than for the “milking” so often practised by local capitalists.

During the subsequent phase, foreign capital is needed qua capital. The entrepreneurial and managerial abilities are there, but the community now does not produce a sufficient amount of savings to employ these abilities fully. Foreign capital now does not need all the trappings of the first phase: it may best take the form of general development loans. Attempts to direct and supervise closely are not only likely to produce resentment but are almost certain to be futile: for when a country has reached the stage where its entrepreneurial skills outrun its supply of domestic capital, it will usually know how to rearrange its planned investments so as to present foreign lenders with the projects it knows to be acceptable while reserving its domestic capital resources for those projects which it knows to be less popular abroad. 7

The supply of savings as a ceiling for the growth path. The transition from the first to the second stage of growth, i.e., from the point where the growth-limiting factor turns from the ability to invest into the supply of savings, should not be considered as a turning point neatly defined in time. Since intersectoral mobility is far from perfect, both for savings and for developmental skills, the transition is likely to occur at different times for the different sectors of the economy. Nevertheless, the coming of this transition may mean that the country will from then on have to follow a slower expansion path than hitherto unless it takes special measures that range from the procurement of large-scale foreign capital imports to fiscal and monetary reforms as well as to the forcible compression of mass consumption.

7. The foregoing paragraphs are a preliminary formulation; see Chs. 9 and 11 for further consideration of the role of foreign capital.
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It is likely that a country that hits the savings ceiling is going to make such an attempt to break through it in some manner; if it does not succeed, it may well fall below it in true Hicksian fashion, for some kind of accelerator is likely to have been at work during the growth process up to the ceiling; therefore, as the rate of advance slows down, economic progress may in fact drop below the ceiling. In any event, this period of transition is likely to be a particularly crucial and turbulent one for a developing country and one during which public opinion may well become ready for extreme solutions.

The Complementarity Effect of Investment

Thus far our theory is still quite anemic. That development is being bred in some fashion in the developed sector of an economy is not only a rather unexciting statement, but it does not permit one to account adequately for the sudden spurts or the unexpected relapses into stagnation that developing countries have often exhibited. We have made development proceed along a path which, although somewhat different from the one traditionally trodden, still has much in common with other, equally unrealistic, models of growth. Development seems impossible of achievement at the early stage (because of the various vicious circles) and well-nigh irresistible later on. We shall now attempt to remedy these defects of our construction.

The role of the ability to invest in the growth process is very similar to that traditionally occupied by the propensity to save. Inasmuch as savings set an effective ceiling to the amount of investment that an economy can actually undertake, they have been considered a necessary condition for investment activity to take place. But because of the independence of savings and investment decisions, savings do not by themselves call forth investment activity and this fact has led precisely to the various attempts to account independently for the latter, through the innovating entrepreneur, past changes in output (induced investment), profits, etc.

The ability to invest is of course more directly related to investment activity. It comprises the ability to perceive investment oppo-
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opportunities, and since, in an underdeveloped country, a large supply of such opportunities presumably exists, the expanding ability to invest may be considered to supply the necessary and sufficient condition for investment to come about. Do we then need any additional apparatus to account for growth? I think we do. Perhaps we can conceive of the investment generated by the ability to invest not as a ceiling but as a floor.9 After all, we related it exclusively to the modern sector, ruling out any contribution from the rest of the economy. The investment undertaken as a result of the growth of the ability to invest is that which is undertaken by people who have been effectively transformed into modern decision-makers by the working of the advanced sector of the economy. They do not exhibit any more the difficulties in acting, in cooperating, in establishing priorities on which we dwelt in the first chapter. But if the economy is to rely only on this process, its growth is going to be painfully slow. Is there not some way in which the energies of the rest of the economy can be utilized so as to produce growth in addition to the trickle that, in the first stages of development, results from the ability to invest?

To be able to give a positive answer to this question, we must locate a mechanism that will make for investments with a force capable of compensating for the characteristic difficulties of underdeveloped countries. I believe that such a mechanism can be encountered in a certain characteristic of investment itself, namely in its contagious effect on more investment. For want of a better expression and for reasons that will become clear, I shall call it the complementarity effect of investment.

Investment is a many-sided actor on the economic scene. Its simultaneous performance as income-generator and capacity-creator is the foundation of modern growth theory. Now we will stress a third role which it plays occasionally on top of the other two: that of pace-setter for additional investment.

Ordinarily, the road from investment to more investment is considered to be rather indirect: investment increases capacity and if the economy expands in such a way as to accommodate this capacity, the

9. At least as long as we take only positive, development-promoting forces into account. The next section will deal with negative forces which may make the “floor” cave in.)
additional income based on the increased capacity will result in more savings, which, in turn, allow additional investments. Also, according to the doctrine of "induced investment," if there is an increase in investment activity from one period to another, "induced" investment in capital goods industries will result. But there is no room in these constructions for any direct effect of the investment of one period on that of the next period.

The fact that such direct effects exist, i.e., that the investments of one period are often the principal motivating forces behind some additional investments of subsequent periods, is of course well known, but for some reason this knowledge has not been fully transferred from the theory of production to the theory of growth. The former has long taught that an increase in production of commodity A may require more production of commodity B or that, because of technical complementarity, it may lower the marginal cost of producing commodity C. Thus investment in the production of A sets up strong pressures for an increase in the production of B and strong incentives for the start of production of C. The reason for which the theory of growth for advanced economies has not made much of these sequences is that they are expected to take place automatically and almost instantaneously; also, with a complete universe of commodities already in production, the needs aroused or opportunities opened up by additional investment result only in marginal adjustment in outputs from existing capacity. In underdeveloped countries, on the contrary, these processes are absolutely basic in determining the expansive path of the economy; and in the next chapters we will try to examine the principal types of such sequences in some detail. The complementarity effect thus reinforces and supplements the slowly growing ability to invest of underdeveloped countries. The investments of one period call forth complementary investments in the next period with a will and logic of their own; they block out a part of the road that lies ahead and virtually compel certain additional investment decisions. These decisions are therefore comparatively "easy to take" and are likely to attract newcomers who will join the rolling development bandwagon while the operators who have had the benefit of the education afforded by the modern sector of the economy may be spared for the

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capacity will result in more investments. Also, according to the theory of growth, there is an increase in induced investment. Thus, less well-trained operators may be left to finish them.\textsuperscript{11}

The complementarity effect of investment is therefore the essential mechanism by which new energies are channeled toward the development process and through which the vicious circle that seems to confine it can be broken. To give maximum play to this effect must therefore be a primary objective of development policy.

What can we say in general about the likely quantitative importance of the effect? Very little. Formally, it would be possible to construe the effect as a multiplier-type relationship so that each investment would lead to investments in the next period in an amount smaller than the original investment; if the relationship were of the opposite type, the complementarity effect would soon swamp all investment. Now it may be expected that the structural repercussions will slowly become exhausted and will be finite in the aggregate; but there is no reason for thinking that this finite sum is likely to be the result of a smooth geometric progression.

On the other hand, for reasons already noted, it is likely that the complementarity effect will lose importance as the economy reaches higher levels of development. New investments no longer lead necessarily to a chain of related new investments once the economy is well rounded out, with all activities nicely dovetailed with one another. It is probably for this reason that the analysis of complementarity has been relegated by economic theory to microprocesses of partial equilibria.

11. As already mentioned (Ch. 1, n. 34), Katona has distinguished between genuine and routinized economic decisions. Routinized is not a good term for a decision the taking of which has been considerably facilitated by previous decisions, but which nevertheless may be taken only once in a lifetime. Our "easy" decisions include, but are by no means limited to, those taken by Schumpeter's "imitators."

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librium; but for underdeveloped countries it deserves a place of honor in any macroeconomic analysis of the growth process.

The point of view which we have acquired thus far can best be made clear by illustrating it through a concrete issue in economic development policy. In a valuable article on the role of small industry in economic development, Aubrey has argued in favor of small industry in a rural or small-town setting on the ground that in this way it is possible to economize on the overhead capital expenditures (water, power, housing, etc.) required by urbanized industry and its labor force.13 This position is of course entirely valid on the assumption that the supply of capital is fixed. But if we drop this assumption and let ourselves be guided by the rule that during a prolonged phase the essence of development strategy consists in maximizing induced decision-making, then we would favor rather than oppose the establishment of industries in cities precisely because it compels additional or complementary capital formation that otherwise might never have taken place.

Obviously, what we are opposing here is not the principle of husbanding capital in general but a policy which in the name of this principle would reduce the stimuli and pressures toward additional capital formation that might emanate from the investments of a given period. Such a policy would indeed economize on capital requirements in the next period, but it would equally inhibit the supply of capital; in effect, therefore, it would “economize” on capital formation rather than on capital.

The Forces Corroding Development

It is not my intention in this section to add to the vast literature on "obstacles to economic development." Whatever small contribution I had to make to this subject has been presented in Chapter 1. My purpose here is rather to remind the reader that these obstacles do not only block or hold back development, but remain very much at work once the development process has started. They then turn into forces making for abortive development and for the stagnation and decay of ventures that looked hopeful at first.

it deserves a place of honor in the growth process.
Since thus far can best be a concrete issue in economic growth studies. Small islands argued in favor of small expenditures on the ground that in this second phase of urbanization, industry and its implications are valid on the assumption that we drop this assumption and enter a prolonged phase the in maximizing induced demand than oppose the establishment. It compels additional or otherwise might never have existed.

The principle of which in the name of this pressure toward additional investments of a given size on capital requirements habit the supply of capital; on capital formation rather than consumption is determined. This is the vast literature on the role of small increments in the growth process. My purpose is to state these obstacles do not remain very much at work. They then turn into forces that stagnation and decay of development, ”Social Research, 18

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Because of the simplified growth models that are so deeply embedded in our thinking, there is a tendency to concentrate on the initial obstacles which have to be removed if development is to be launched at all. While the possibility of decay and stagnation has long been recognized, it has been seriously studied only for the mature economies of Western Europe and the United States. The reason lies in the strong mental habit: we are fond of interpreting events in terms of biological growth patterns (birth-youth-maturity-old age-death), historical cycles (rise and decline), and perhaps logistic growth curves (acceleration followed by deceleration), but we seem to be unwilling to admit that growth can be halted or stunted even in its early stages.

These habits are reinforced by observation of the behavior of individual industries in economically advanced countries which indeed have frequently exhibited the cycle: accelerating progress—decelerating growth—stagnation—decline. Over-all growth of the economy has been assured as a result of growth leadership passing from one industry to another.

However, the idea that development, once started, will proceed smoothly for some considerable time until the problems of "maturity" and "old age" appear, gives a misleading image of the growth problems of underdeveloped countries. A more apt analogy has been proposed by Rostow: that of the take-off of an airplane. Here at least attention is duly focused on the early phase of a country's economic development which may or may not result in a cumulative growth movement depending on the momentum that is gathered. It certainly is true that, during this phase, considerable uncertainty prevails about the chances of success of the country in its bid to join the developed countries. Forward steps are halting and scattered, difficulties abound, achievements are fragile and continued growth seems extraordinarily dependent on careful nursing, creative individuals, and good luck.

Then, at a later point, we suddenly feel that we no longer need to worry so much, that a solid foundation exists, that economic progress has become institutionalized and routinized to a certain extent. As

the principal criterion for determining whether "take-off" is being achieved, Rostow uses a sharp increase in the ratio of investment to national income. But this is at best a diagnostic device. Behind the rise in the investment ratio lie crucial changes in certain characteristic features of the development process.

That development leads a precarious existence during its first stages and can easily become abortive can hardly be doubted. In almost all underdeveloped countries we can find examples of industrial ventures that have gone to seed, and of other hopeful beginnings that have turned into disappointments. I am not now referring to ventures that were badly planned from the start, but to those that, after having worked well for a while, have deteriorated or decayed for one reason or another. It is a common observation in underdeveloped countries that it is far easier to start an industry than to keep it operating efficiently over a period of several years. The difficulty of ensuring regular maintenance and repairs of irrigation canals, highways, buildings, and machinery is one of the most striking common denominators of the underdeveloped world.

How can we build these widespread phenomena into our theory? Are there forces hostile to development that the development process itself brings into being?

Economists have paid attention to this type of sequence mainly in the analysis of the effect of development on population increases. Here a number of neo-Malthusian models have been developed that show how an initial increase in income may result in a population increase that swallows up the increase in income; the models show under what conditions a country will be caught in, or will be able to break out of, such a "low-level equilibrium trap." No doubt the sequence: growth in per capita income→increase in population→decline in per capita income is a particularly fascinating aspect of the possibilities of abortive development, both because of its possible practical relevance in many important underdeveloped countries, and because it is susceptible of easy and fairly meaningful mathematical manipulations.

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But the increase in population is obviously only one of many forces that are set in motion by development and may react adversely on it. If growth starts at a few points rather than everywhere at the same time, then tensions arise naturally between the modern and the traditional sectors, and just as the modern sector breeds the "ability to invest," so will the traditional sector now secrete attitudes and actions that will in effect corrode and undermine the country's economic progress.

Such negative effects must be recognized as a third independent factor determining the growth pattern of underdeveloped countries jointly with the two positive factors that have already been discussed. Consequently, the direction of economic development policy ought to be shaped by some knowledge of these forces of stagnation and decay, of the areas where they attack with particular virulence and effectiveness, and of the manner in which they can be checked. We shall return to these problems in greater detail in Chapter 8.

A learning model applicable to economic development. A few years ago, H. A. Simon suggested that certain types of self-regulated behavior, such as voluntary learning of a foreign language, might be described by what he called the "Berlitz Model." 17 Since I believe the model to be very suggestive for the aspects of the development process I have been discussing, I shall describe it briefly in non-mathematical terms: Simon supposes that an individual who desires to learn French starts out with a given level of difficulty or ignorance. The more he practises, the more he will reduce the difficulty, but for each level of difficulty there is one rate of practice (hours per day) beyond which practising is unpleasant so that if this level is reached or exceeded, practice will be reduced the next day. If the student starts out with a rate of practice that is felt as unpleasant, we are going to witness a race between the rate at which he learns French and the rate at which he reduces his studying. He may give up before he has learned, or alternatively he may advance sufficiently so that one day he reaches a point at which the amount of studying he still engages in is felt as pleasant rather than unpleasant; from then on, he


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will lengthen his daily periods of study and he will surely learn. A third possibility is that, being aware that long periods of study are unpleasant in the beginning, he will start out by studying for short periods so that studying is pleasant all along and will be slowly increased until the subject is mastered.

I find it tempting to look at development with the help of this learning model. Somewhat like a person who decides in a fit of enthusiasm to learn a foreign language, a country that sets out on the road to development often does not realize the difficulties of the task ahead. As these difficulties appear, as it becomes clear that the price of development is high one in terms of human suffering, social tensions, forced abandonment of traditional behavior and values, etc., "practice" may be reduced, contradictory and harmful economic policies are being adopted, and development will be slowed down and perhaps halted. On the other hand, if income growth reaches a point where the benefits of development are felt to outweigh the dislocations it brings with it, "practice" becomes pleasant and is gradually increased, and the country will reach its developmental goals. This model argues in favor of some forcing of the pace in the early stages of development, to overcome the resistances that then are strongest.\footnote{18}

Naturally, a far smoother road toward development would be via the third alternative of Simon's model, i.e., by undertaking development in very small doses at first so that all unpleasantness is avoided from the start. This process may be applicable, and is an excellent model to keep in mind, with respect to situations encountered in small-scale and community development projects as well as in many technical assistance activities of an educational nature. But, as we saw in our discussion of the group-focused image of change, the decisions that have to be made when an underdeveloped country attempts to

18. The model is in a sense a qualified version of the "Gerschenkron model." According to the latter, a backward country compares the expected benefits of development with the expected cost implicit in the effort to shed backwardness. In the Berlitz model, the initial decision may be construed to follow from an \textit{ex ante} weighing of this sort, but the follow-through operations are then influenced by actual experience, i.e., by successive \textit{ex post} weighings of realized benefits against realized costs. In this way, the Berlitz model takes care of the points which in Ch. 1 were raised in criticism of Gerschenkron's view on the development of latecomers.
modernize its economic and social structure are almost certain to imply a certain amount of "painful practice."

It is clear by now that we do not propose a rigid model of economic development. In this chapter we have identified one force that by itself would make for steady growth: the ability to invest. But economic development can in effect be far more rapid or far less successful than would be indicated by this basic factor because of the presence of other dynamic positive and negative forces which we have described. To understand how these forces can be activated or checked, respectively, is then our most important task. Our foray into the theory of development has thus left us with a heightened consciousness of the importance of a theory of development strategy.